ESTABLISHED IN 1872

PAPER TRADE JOURNAL

PAPER

SIXTY-FOURTH YEAR

Established Feb. 17, 1899
Consolidated Nov. 16, 1899
with PAPER TRADE JOURNAL.

Vol. CI, No. 25 Thursday, December 19, 1935

Established Sept. 21, 1918
Consolidated Feb. 19, 1925
with PAPER TRADE JOURNAL.

Superintendents to Meet at Grand Rapids, Mich.

Annual Convention Which Was Slated for Kalamazoo Is Changed After Local Committee Makes Investigation and Reports Facilities for Handling the Meeting are Inadequate—New Date for the Convention is Fixed for June 24-26, One Week Later Than Originally Announced—F. L. Zellers is General Chairman

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., December 16, 1935—The 1936 annual convention of the American Pulp and Paper Mill Superintendents Association will be held in Grand Rapids, Mich., June 24-26. Kalamazoo was awarded the convention by the executive board at the meeting in Buffalo in October, but the local board, after making a complete survey of Kalamazoo's accommodations for handling the convention, decided they were inadequate and withdrew the invitation to come to Kalamazoo.

At the November meeting here the matter was discussed and a vote was taken by the members, the result of which was Grand Rapids, Mich., being the choice. The executive board concurred with this action. The general chairman of the convention is F. L. Zellers of the French Paper Company, Niles, Mich.

B. C. Pulp & Paper Co. Makes Improvements

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, B. C., December 14, 1935—Extensive additions and alterations and installation of new machinery, is at present being undertaken at its plants at Woodfibre and Port Alice, B. C., by the B. C. Pulp and Paper Company. The project is to cost approximately $350,000, with a view to reducing production costs and improving the quality of the pulp turned out from its two plants.

An important factor in the program will be installation of a new chemipulp system at both plants. This installation is now under way at Port Alice, and will be undertaken at Woodfibre early in the new year.

At Woodfibre a new wharf and warehouse costing $40,000 is now being completed. The wharf replaces the existing structure and provides better accommodation for deep-sea ships loading direct at the plant. The warehouse increases the accommodation at the plant.

The company has also completed a thorough overhauling of its mill at Woodfibre. When the announcement was made of the closing down of the Japanese market for B. C. pulp, the firm decided to shut down its Woodfibre plant and complete all repairs which would normally be spread over a year. This work has now been completed and the plant is again in operation. Special attention was paid to the machine room, where new equipment was installed. The company has also completed the erection of a number of new dwellings and a bunkhouse at its Port Alice plant at a cost of approximately $40,000.

November Newsprint Production

Production of newsprint in Canada during November, 1935, amounted to 262,854 tons and shipments to 285,179 tons, according to the Newsprint Service Bureau. Production in the United States was 78,929 tons and shipments 80,875 tons, making a total United States and Canadian newsprint production of 341,783 tons and shipments of 366,054 tons. During November 28,567 tons of newsprint were made in Newfoundland and 2,045 tons in Mexico, so that the total North American production for the month amounted to 372,395 tons. Total production in November, 1934 was 346,189 tons.

The Canadian mills produced 148,809 tons more in the first eleven months of 1935 than in the first eleven months of 1934, which was an increase of 6 per cent. The output in the United States was 39,315 tons or 4 per cent less than for the first eleven months of 1934, in Newfoundland 17,162 tons or 6 per cent more, and in Mexico 905 tons more, making a total increase of 127,561 tons, or three and six-tenths per cent.

Stocks of newsprint paper at Canadian mills were reported at 50,993 tons at the end of November and at United States mills 12,394 tons, making a combined total of 63,387 tons compared with 87,658 tons on October 31, 1935.

Gov. Brann Sees Sec. Sayre About Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 18, 1935—Governor Brann of Maine was in Washington last week to talk with various government officials.

While he was here, accompanied by J. W. Taylor, representing the pulp and paper workers of the state of Maine, he visited Assistant Secretary of State Sayre, who is in charge of trade agreements for the government. While the governor would not discuss the matter it is generally believed that they took up the matter of paper quotas in the trade agreements with the secretary.

Newsprint Output Surpasses Previous Record

Canadian Mills Now Operating At 80 Per Cent of Capacity—Production for First Ten Months of Year 6 Per Cent. Ahead of Corresponding Period of 1934—Figures Indicate Industry Steadily Entering Seller's Market Stage

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., December 16, 1935—The good old law of supply and demand is working steadily for the rehabilitation of the newsprint industry, despite all the artificial obstacles in the way. With mills now working at 80 per cent of capacity—a pretty good pace in these days, monthly production has begun to surpass all previous records. For the first ten months of the present year the output has been six per cent ahead of that of 1934. Present indications are that for the full year the production will amount to 2,800,000 tons, as compared with 2,599,292 tons in 1934 and 2,728,800 in 1929, the previous all-time record.

Entering the Seller's Market Stage

These figures support the view that newsprint is steadily entering the seller's market stage, especially in view of the fact that of the 20 per cent unused capacity only a small amount is immediately available, the greatest part of the balance being estimated from potentialties of mills that are now closed and where production could not be readily or economically established.

Settling Matters of National Concern

During the past week a conference has been in progress between the Dominion government and the premiers of all the provincial governments with a view to settling matters of national concern. Whether or not the difficulties attending the newsprint industry will be discussed remains to be seen, but the view is held that it is not a remote possibility that Premiers Taschereau and Hepburn of Quebec and Ontario respectively will confer with Mr. King and some of his ministers at the Dominion-Provincial Conference with regard to the situation and, in keeping with the spirit of the parley, try to bring order out of chaos in what should be one of Canada's leading productive assets.

Australia To Buy More Newsprint

L. R. MacGregor, Australian Trade Commissioner in Canada, states that in the past fiscal year, ending March 31, Australia purchased 100,000 tons of newsprint from Canada. Much of this has been supplied by British Columbia mills, but he states that for the current year it is estimated that 100,000 tons of newsprint will be shipped to Australia from the port of Montreal alone, irrespective of the shipments from British Columbia.

New Pulp Mill Near Vancouver

J. P. Meehan & Co., who have been in the lumber business in British Columbia for the past quarter of a century, are busy with plans for the establishment of a 500-ton pulp mill in British Columbia, the timber holders in the company being anxious to get a return on their investment and regarding the establishment of a rayon mill as the most promising step in that direction. According to William Meehan, one of the directing heads, the company would prefer to have the mill near Vancouver. It is now negotiating with the authorities for the use of Cheakamus power rights. Cheakamus is located about twenty miles north of Squamish, which is the southern terminus of the Pacific Great Eastern Railway on Howe Sound. Squamish might be the side of the proposed mill, but the Meehans would prefer a location nearer Vancouver. The mill is to have a capacity of 500 tons of pulp daily, the chief product being rayon pulp. It is hoped construction will start in the spring.

F. C. Boyce Retires from Wausau Paper Mills

In the summer of 1929, Fred C. Boyce, having attained the age which he had set as his goal for retirement, tendered his resignation as superintendent of the Wausau Paper Mills Company, Brokaw, Wis., effective as of July 1st of that year. His intention at that time was to spend the remaining years of his life at more play and less work. But then, in October 1929, came "the crash." The Wausau Paper Mills Company had up to that time not obtained a permanent superintendent, and Mr. Boyce was persuaded to again put his shoulder to the wheel for them, and he began work on November 1st of that year.

Now, after six years, he has again decided it is time for less work and more play, and his resignation as superintendent of the Wausau Paper Mills Company was tendered and accepted as of December 1, 1935.

Mr. Boyce's career as a paper maker was a long one—53 years all told. After finishing his education in the public schools of Corinth and Saratoga Springs, N. Y., he went to work in the paper mill of the Hudson River Pulp and Paper Company. Here he worked for nineteen years. In 1901 he went to work for the Fills Manufacturing Company at Oconto Falls, Wis., and in 1904 he entered the employ of the Wausau Paper Mills Company of Brokaw, which company he served as superintendent for thirty-one years.

In 1919 the American Pulp and Paper Mill Superintendents' Association was organized, and Mr. Boyce was chosen as its first president and leader. His untiring zeal and hard work in the interests of this association endeared him to all its members, and he has for years affectionately been called the "Daddy of the Superintendents' Association."

Mr. Boyce has always taken an active interest in the affairs of the community in which he lives. He is a member of the Methodist Episcopal Church of Wausau, is affiliated with the various Masonic organizations, and is a member of the Elks and Moose Lodges. He has also served on the National Council of the Y. M. C. A. and was the president of the Wausau Y. M. C. A. for five years.

Although he will no longer be actively connected with the Wausau Paper Mills Company, he still retains his interest in this company. As president of the D. J. Murray Manufacturing Company of Wausau, and vice-president of the Wisconsin Paper and Products Company of Milwaukee, Wis., he will continue to be actively engaged in these organizations.

Mr. Boyce plans to spend his winters in the sunny South and his summers at his summer home at Minocqua, Wis.; the intervening time being spent at his home in Wausau.

His many friends wish for him many years of more play and not so much work.

Demand for Paper Moderately Active In Boston

Fine Paper Business Approximately 15 Per Cent Better Than In Corresponding Period Last Year—Wrapping Paper Section Less Active—Box Board Division Seasonally Quiet—Some Improvement Transpires In Paper Stock Market

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., December 16, 1935—The Boston paper market was fair last week, considering the season of the year. In some quarters, business in fine paper was reported as "pretty good." At one fine paper house, it was stated that business was 15 per cent better in December so far than in the same month last year. At another, it was intimated that they were trying to sell as much as possible before taking an inventory. There was less activity in wrapping paper. One large concern has been receiving orders ahead for January shipment, but buying for delivery has been rather slow. It is said that the retail trade, such as department stores, would prefer not to buy until after the turn of the year. The box board market was seasonally quiet.

Contrary to usual conditions at this time of year, strength has developed in a number of grades of paper stock and has continued in some others, with considerable movement in certain lines. Old papers were very active, with prices well maintained, although no higher. Bagging was strong, values advancing in three grades. Foreign gunny No. 1 rose from a flat 2.00 to 2.00 @ 2.25, domestic gunny No. 1 to 1.80 @ 2.00 from 1.75 @ 2.00, and heavy wool tares to 2.00 @ 2.10 from 1.90 @ 2.00. New domestic bags were strong and in fair demand, with prices unchanged. Old domestic rags were not sought after so much, but the call is expected to be better after the first of the year. Foreign rags were firm. The demand for dark cottons improved, with the price advancing to 1.60 @ 1.70 from 1.40 @ 1.50. An attempt was made to weaken the market, but it was unsuccessful. One house was offered 1.60 for dark cottons on Thursday. Some dark cottons are coming into the market, but not in great quantities.

Direct Mail Paper Exhibits

The exhibition held in connection with the Third Annual New England Direct Mail Advertising Association at the Hotel Statler, December 9, 10 and 11, was well attended. There was a remarkable showing on the part of the paper and other trades of Boston allied with the graphic arts. Exhibitors included the following:

Local—Arnold-Roberts Company, Boston Envelope Company, John Carter Company, Carter, Rice & Co. Corp., Curtis 1000, Inc., International Printing Ink Corporation (2), Plimpton Manufacturing Company, Division U.S.E., Storrs & Bement Company, Tileston & Hollingsworth Company, and United States Envelope Company.

National—American Writing Paper Company, Appleton Coated Paper Company, B. H. Bunn Company, Inc., Crocker-McElwain Company, A. B. Dick Company, Dill & Collins, Inc., Eastern Manufacturing Company, Falulah Paper Company, Gilbert Paper Company, Hammermill Paper Company, International Paper Company, Linweave Association, Rising Paper Company, Strathmore Paper Company, S. D. Warren Company, and Whiting-Plover Paper Company.

News of the Industry

The Tileston & Hollingsworth Company has issued to printers a very attractive mailing piece of Crinoline Super Plate, on which is printed a description of the paper. A cluster of flowers in colors is shown. Crinoline Super Plate is easy to handle and folds well. This paper is made in various sizes and weights in white and India. The mailing piece is accompanied by an order card of 3 ply white Mattapan Index Bristol.

November was the third largest month in the history of the H. D. Catty-Franz Euler Corporation, dealer in confectioners' and other papers for packaging, which was incorporated in 1928. The biggest achievement this fall was the adoption by the S. S. Pierce Company, high quality grocers with various stores, of "Cellophane" for wrapping American cheese, cut into pound and half-pound pieces. The cheese can be cut up in advance and kept as long as ten days without crusting. By the use of "Cellophane" the company is enabled to cut their cheese for prospective orders two days in advance, saving rush and overtime. The First National Stores and the Economy Stores are much interested in the idea.

Robert W. Thompson, representative of The Howard Paper Company, Urbana, Ohio, attended the New England Direct Mail Advertisers Association here last week and visited the Andrews Paper Company, who represent that concern.

D. P. Rhoades, salesman for the Waterfalls Paper Mill, Mechanic Falls, Me., called on the trade last week.

E. I. Wiseman, manager of the announcement department, and Leon M. Poore, sales manager, both of John Carter & Co., Inc., attended the recent meeting of the Eagle-A Announcement Association, held at the offices of the Kent Paper Company, New York.

Dilts Machine Works Personnel Changes

At a recent election of officers of the Dilts Machine Works, Inc., Fulton, N. Y., L. D. Bennett was elected president to succeed the late B. W. Bennett. J. D. Haskell, who has been associated with the company for the past 15 years has been made vice president and general manager. J. D. Bennett was elected treasurer and W. J. Bennett secretary. J. D. Bennett recently joined the firm after spending some four years with the Texas Company in China. He is a son of the late B. W. Bennett.

The Dilts Company has also recently added George Engert to its sales force. Mr. Engert has had some 25 years' practical paper-making experience and in securing his services the Dilts Company offers a wider service to its customers in having available a salesman who is a practical paper-maker familiar with papermill problems. G. P. Prather, well known in papermill engineering circles, continues as sales engineer.

Great Lakes Paper Sale

A special dispatch from Montreal, dated December 15, to the *New York Times*, states that the Supreme Court of Ontario in Toronto will be asked on Friday to issue an order approving the sale of the Great Lakes Paper Company's assets to John E. Gefaell and Lyon E. Aldrich. Notice to this effect is being given by the National Trust Company, as receiver and manager of the company, to meet the requirements of the United States Securities Act of 1933 and amendments.

Paper Demand Seasonally Quiet In Chicago

Low Ebb of Holiday and Pre-Inventory Lull Reached—Prices of Rag Content Papers Strengthening—Kraft Paper Fundamentally Strong—Position of Ground Wood Paper Improves —Several Grades of Paper Stock More Active

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., December 16, 1935—The Chicago paper market gives evidence of reaching the low ebb of the holiday and pre-inventory lull. Prices in some lines are materially strengthening, this situation being evidenced in rag content papers, certain lines of waste papers and others. Despite the slackening in demand Chicago interests are impressed with the volume of retail sales now being experienced here. Retail sales are approximately 8 per cent ahead of last year, and the paper industry points to this as conclusive evidence that the buying market will be strong following the completion of inventory proceedings.

Locally the kraft market continues to make progress, according to reports, with demand showing a healthy increase and the market fundamentally strong. Ground woods also continue their favorable improvement. Sulphites remain seasonally quiet, although sufficient "good days" are reported to indicate that this situation is only temporary. The entire fine paper industry here is in virtually the same position. Books and covers are finding the business world considerably more willing to discuss advertising and direct mail commitments for 1936 which gives a satisfactory undertone to this market. Waste papers have shown signs of coming out of the doldrums, with certain grades said to be more than ordinarily active.

News of the Industry

The executive offices of the Link-Belt Company, for many years located at 910 South Michigan Avenue, have been removed to the Bell Building, 307 North Michigan Avenue, where the entire twenty-third floor and half of the twenty-first floor will be utilized to house this important supplier to the paper industry.

Last week Ray Wantz, head of the Rockford Fibre Container Company, relinquished the presidency of the Illinois Manufacturers' Association after serving faithfully and in a way that is most creditable to the industry he represents. Tom Hammond, South Chicago manufacturer, succeeds him. Mr. Wantz served as president during one of the most important periods in the history of the Association. His tenure of office included the NRA days and all the perplexities of taxation and social security legislation arising from this period. Mr. Wantz brought his period as president to a close with a stirring effort to stem the passage of unemployment compensation legislation in Illinois and personally appeared over the radio in an attempt to defeat this legislation. He will continue as chairman of the board of the organization.

The Central Manufacturing District Club, an organization of executives of firms located in this important manufacturing district of Chicago, recently announced the election to membership of John H. Vail, Union Bag and Paper Corporation.

New construction work sponsored by the Cromwell Paper Company and reported last August, has now been completed and the makers of tympan papers are now utilizing the new unit of 30,000 square feet located at 4801-29 South Whipple Street, Chicago, in the Kenwood Manufacturing District. This is the second time within five years that the company has added new space, the new plant embodying the latest features in industrial construction including a modern air conditioning system. The addition, it is reported, was necessitated by the steadily increasing volume of business, together with a demand for several new Cromwell products, including the patented travelling tympan device which has been favorably received by the printing industry.

One of the features of the recent exhibit of new industrial products and uses sponsored by the Purchasing Agents of Chicago was an exhibit of samples and uses sponsored by Gaul & Ingalls, coarse paper merchants, located at 1501 South Laflin Street.

The Middle West Division of the Salesmen's Association of the Paper Industry is making extensive plans for its Christmas program, which will probably fall on Friday, December 27, at the Brevoort Hotel. Ben Babbitt is in charge of this holiday event, which always attracts a big attendance from guests who want to participate in this enjoyable "open house" affair.

The matter of whether or not paper merchants are selling paper direct to printers' customers is being decided by a joint arbitration board of printers and paper merchants, who take up and decide reported complaints on this subject. The two Chicago members of the committee are W. N. Gillet, Chicago Paper Company, and George Cobean, representing the J. W. Butler Paper Company. Both the paper merchants and the printers and allied sources have entered into an agreement covering the limitation of direct sales of paper to the consumer, and the arbitration board has a joint statement of policy to back up its decisions.

Chicago is expected to be the scene of at least one of the 1936 meetings of the Paper and Twine Club, organized last Fall to promote better feeling and mutual understanding between manufacturers and jobbers of paper. It is possible that the Chicago informal luncheon meeting will be held at the time of the Fall meetings, while the New York sessions will be held in conjunction with the February annual convention of the industry.

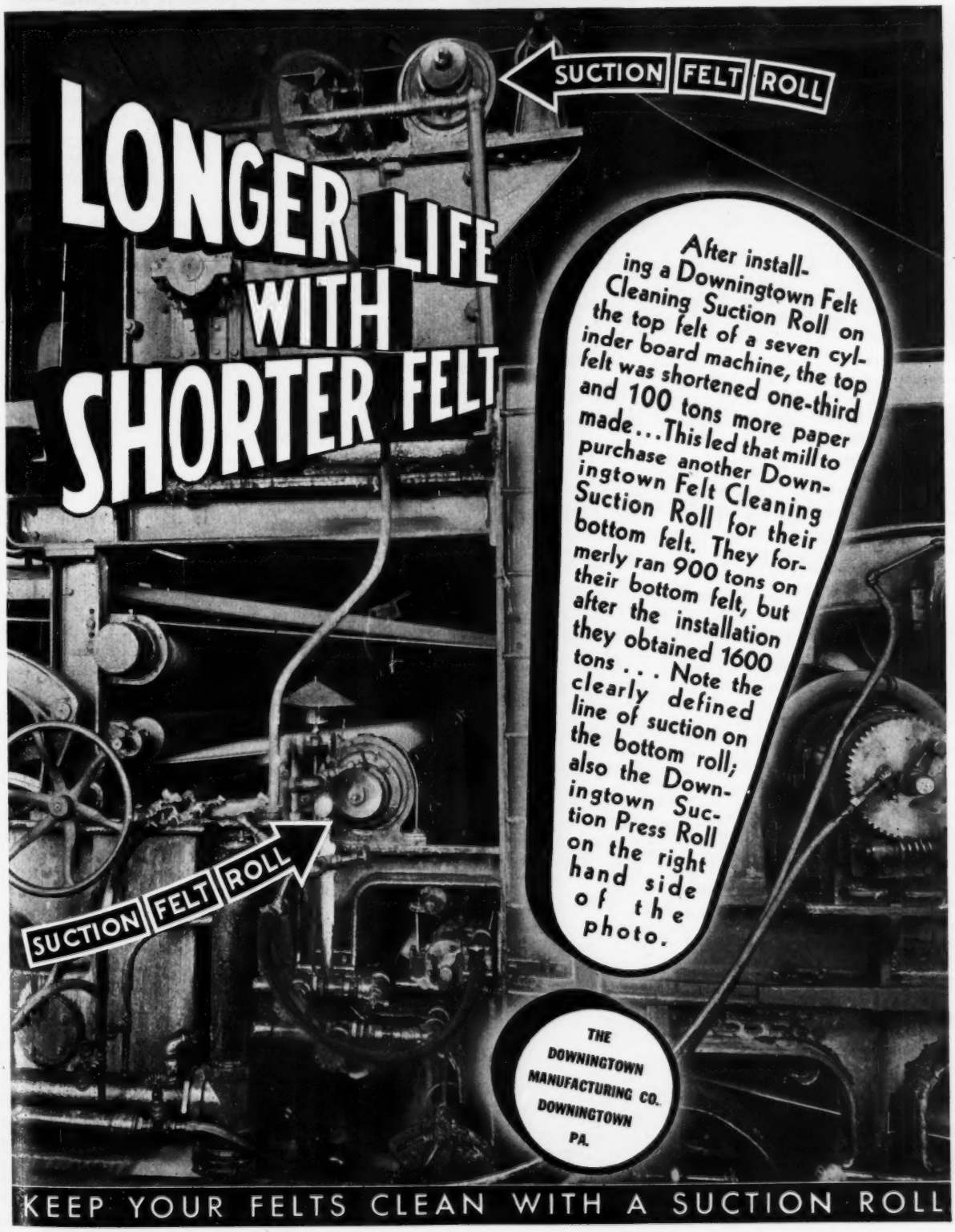
A. J. Dubuc Goes with Mt. Vernon-Woodberry

The Mt. Vernon-Woodberry Mills, Inc., announce the addition of A. J. Dubuc to their sales and technical staff. Mr. Dubuc has been very closely connected with the paper industry for many years and will act as contact man between the paper mills and the Mt. Vernon-Woodberry Mills' unit at Columbia, S. C., where Richland and Mt. Vernon Drier felts are manufactured. He will devote his entire time to the development of drier felt business, which we know will be good news to his many friends in the paper mill business.

D. L. Stocker Made General Manager

At a recent meeting of the board of directors, D. L. Stocker was appointed general manager of the Michigan Paper Company, Plainwell, Mich. Mr. Stocker was formerly vice-president of the Detroit Sulphite Pulp and Paper Company and was previously connected with the Hawley Pulp and Paper Company of Oregon City, Ore., and the Bryant Paper Company of Kalamazoo.

DOWNINGTOWN


SUCTION FELT ROLL
LONGER LIFE WITH SHORTER FELT
After installing a Downingtown Felt Cleaning Suction Roll on the top felt of a seven cylinder board machine, the top felt was shortened one-third and 100 tons more paper made... This led that mill to purchase another Downingtown Felt Cleaning Suction Roll for their bottom felt. They formerly ran 900 tons on their bottom felt, but after the installation they obtained 1600 tons . . . Note the clearly defined line of suction on the bottom roll; also the Downingtown Suction Press Roll on the right hand side of the photo.
SUCTION FELT ROLL
THE DOWNINGTOWN MANUFACTURING CO. DOWNINGTOWN PA.

KEEP YOUR FELTS CLEAN WITH A SUCTION ROLL

Paper Mill Activities Slow Down In Ontario

Demand for Various Grades of Fine Paper, However, Fairly Well Sustained—Slight Downward Price Readjustment Effected—Coarse Paper Conditions Somewhat Irregular—Manufacturers of Paper Board Decidedly Busy

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., December 16, 1935—There has been the usual slowing down of activity in manufacturing and wholesale paper circles at this time of the year and the year is closing with increased turnover as compared with 1934. Inventory season is approaching and most of the distributors are forecasting a satisfactory year's business to be shown on annual statements.

Through the fall months activity in fine papers has kept up well and the market has continued strong despite some slight downward price readjustments that have taken place recently. Trade in nearly all fine paper lines is currently good and a fair turnover is taking place in specialty lines not covered in the category of books, bonds, writing and ledgers which are meeting with quite a strong demand.

There is a fair movement, for instance, in coated paper lines replacing the rather slight demand of some weeks ago. Coated paper plants are now fairly busy and a tendency is seen toward the purchase of better classes of paper by the consuming trade.

On the other hand, the coarse paper market is not in as satisfactory condition as might be desired, due largely to lack of co-operation within the section itself, although, some improvement has been shown of late. The era of large sales in coarse papers, however, has not yet been reached. Paper bag plants are only moderately busy and the demand somewhat light.

The paper converting trade has had a fair pre-Christmas trade, there having been satisfactory sales of papeteries and general stationery lines. Generous repeat orders are anticipated in stationery lines. Envelope makers have been passing through a rather quiet period, but some improvement has been noted in both standard and specialty lines of the product. Kraft papers are meeting with a somewhat improved demand. Perhaps the busiest section of the paper trade is that devoted to the manufacture of paper board. Most of the board mills are quite busy and in some cases distributors have been asked to hold back orders temporarily. The paper box trade has been fairly good and most of the plants have done a good pre-Christmas business with a turnover surpassing that of last year. Tissues and lightweight papers generally are quite active.

Bathurst Paper Increases Exports

Expansion in demand for paper board, both in the domestic and export markets, has been widely reflected in operations of Bathurst Power and Paper Company, Ltd. It is understood that the company has made arrangements for the conversion of another machine to kraft board production, a machine that has been practically idle for some time past. Operation of this machine, in addition to increasing sales and earnings of the company, will, it is indicated, result in a material saving of overhead.

Export business has been an important factor in the improved operations of Bathurst, the location of the company's mills giving it an advantage in supplying the United Kingdom market, which, it is understood, has absorbed about fifty per cent of the company's board production this year.

The extent of the increase in paper board exports during the current year is indicated by trade figures from Ottawa, which show that for the twelve months ended September 30 last, shipments from Canada were valued at $2,836,120 as compared with $1,861,747 for the twelve months ended September 30, 1934, a gain of over $1,000,000. The bulk of this gain has apparently been due to increased demand from the British market.

Dryden Paper Increases Earnings

A net profit of $6,815 against a loss of $38 in the previous year is reported by Dryden Paper Company, with mills at Dryden, Ont., in its annual financial statement for the year ended September 30. Improvement in business during the autumn months is credited for the gain in earnings by J. H. A. Acer, president, who states in his report to shareholders that the market for sulphate pulp in the United States has improved, and that there is reason to hope for continued improvement.

Profit for the year before charges aggregated $103,782 as against $77,434 in the previous year, and after addition of income from investments of $8,655 an amount of $112,437 was available for charges. Interest on the first mortgage, directors' fees and salaries of executives amounted to $105,622, and left the above net profit. After provision of $10,379 for depletion and $17,880 as appropriation for sinking fund a debit balance was carried forward of $68,537, as against a debit balance of $47,093 brought into the year. The company's working position shows an improvement of $14,482 during the year, net working capital standing at $283,447, as against $268,965 in the previous year. Current assets are shown as $326,493 and current liabilities $43,046.

Great Lakes Deal Still Live Issue

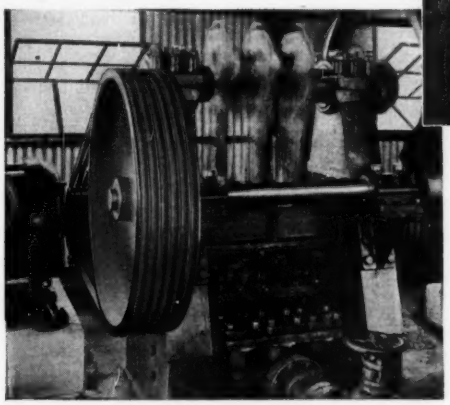
Probably no merger but some effective plan of unification of operations of Ontario and Quebec newsprint companies, is now said to be behind the insistence of industrial interests that the Gaefael-Aldrich offer for Great Lakes Paper Company be not accepted.

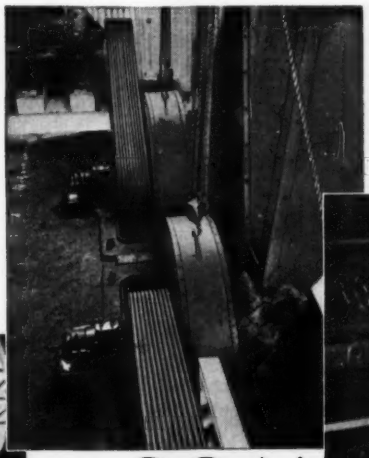
Recent reports from Montreal indicate that units of the industry in the two provinces have gone some distance in convassing a plan whereby operations would be consolidated in such a way as to permit the trading of tonnage. That is, Ontario mills, to a greater extent than in the past, would make shipments to western customers of Quebec plants, while eastern plants would make deliveries in the east for Ontario mills. An average saving of around $3 per ton is claimed for the plan in respect of freight charges alone. Great Lakes Paper is said to have been included in the scheme.

In the meantime controversy among Great Lakes bondholders continues, the latest development being a letter from L. M. Collins in answer to the recent letter of Louis L. Lang asking for proxies to be voted against the Gaefael-Aldrich offer. The recent bondholders' vote on this offer is scheduled to go before the courts here for final decision in a few days' time. Mr. Collins points out that Mr. Lang is vice-president of the Mutual Life, which holds $2,990,000 of newsprint bonds of which only 8.36 per cent are bonds of Great Lakes. Mr. Lang's interest, therefore, is

OIL

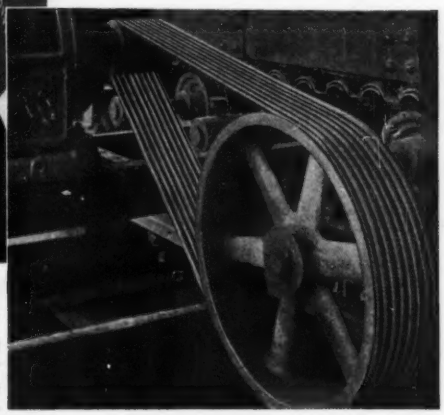
A Gilmer multiple V-Belt drive on a heavy duty Triplex pump, evenly transmitting a heavy load on a large speed ratio without carrying the pulsations of the pump through the belting to the motor.





PAPER

Two sets of ten Gilmer V-Belts on a wood chipping machine. Correctly engineered, multiple drives repay their initial cost many times over in such installations on pulp making machinery.



COAL

Gilmer V-Belts on a coal conveyor, operating under a variable load and large speed ratio, without protection from dirt, dust and moisture.

GILMER V-BELTS

pull troublesome V-drives up to par!

In practically every industry difficult V-drives respond quickly to the efficiency of Gilmer V-Belts. Full-moulded and designed to *fit* V-grooves . . . and ruggedly constructed of three compositions of tough, flexible heat-resisting compounds . . . Gilmer V-Belts are free from wasteful slipping, have sufficient stretch and run "cool." You can depend upon them to provide efficient and economical power transmission under every operating condition. Sold in standard stock and special sizes to fit any make or size of drive.

Gilmer BELTS

KABLE KORD FLAT BELTING

Designed along the "two-belts-in-one" principle—combining a contactor belt and a power belt—Kable Kord is the most outstanding flat belting in industry today. On flat pulleys for group drives, short centers and pivoted motor bases, it transmits more pull per square-inch than any other flat belt made. Write for interesting Kable Kord Data Book. It's free.

L. H. GILMER COMPANY, Tacony, Philadelphia

Manufacturers OF COMPLETE LINE OF POWER BELTING

V-Belts—Kable Kord Roll and Endless Flat Belting—Planer Belts—Speedage Endless Fabric Belts—Cone Belts—Roving Frame Belts—Moulded Rubber Belts—Winder Belts—Spinner Belts—Refrigerator and Washing Machine Belts—Conveyor Belts—Round Roll and Endless Fabric Belting—Endless Belting—Endless Cotton Belts—Laundry Feed Ribbons.

SPECIALISTS IN QUALITY BELTS SINCE 1903

not the interests of Great Lakes bondholders, he states. Mr. Collins urges bondholders not to give Mr. Lang authority to vote their bonds.

Notes and Jottings

Continental Paper Products, Ltd., manufacturers of paper bags, sacks, paper specialties and cartons, Ottawa, are building an addition 180 x 79 feet, to the factory, at an approximate cost of $25,000. The new building will be of solid brick and steel construction and is to be completed the latter part of January. It will provide space for a much-needed new office and additional space for the hand-work department. The company's staff will be slightly enlarged when the building is completed.

Canadian Industries, Ltd., plans to increase their production of the cellophane factory in Shawinigan Falls early in 1936. The program of expansion will include both structural additions and the installation of new equipment.

T. L. Crossly, pulp and paper lecturer for the University of Toronto, is delivering a series of lectures on the history and development of the paper industry to a class made up of employees of the Hinde & Dauch Company, Toronto. Mr. Crossly is also lecturing to a class of printers sponsored by John Atkins, manager of the Toronto Graphic Arts Council.

The usual dividend was declared by the Interlake Tissue Mills at a recent meeting of the company's directors.

C. V. Hodder, secretary of the Canadian Paper Box Manufacturers' Association, Toronto, has been notified from Ottawa of a sales tax imposed on dies. The basis on which dies should be computed would be the cost of raw material, plus labor at $1.25 per hour, such labor being regarded as including overhead and profit. The Sales Tax Department rules that the box manufacturer should segregate the amount of labor in hours spent on the manufacture of dies and that sales tax must be paid thereon.

Lake States TAPPI Discusses Microscopy

The Lake States Section of the Technical Association of the Pulp and Paper Industry met for its regular dinner meeting on Tuesday, December 10, 1935, at the Conway Hotel in Appleton, Wis. After a brief business session, the speaker of the evening, Mr. John H. Graff, who is Research Associate and Instructor in Fiber Microscopy at the Institute of Paper Chemistry, presented a splendid and informative discussion on the subject: "The Use of the Microscope in the Pulp and Paper Industry."

John Graff Speaks

Mr. Graff presented in a condensed form the developments in the technique of the use of the microscope which have appeared within the past decade. The speaker described methods whereby the degree of cooking and of bleaching can be closely determined, thus enabling more accurate control in these departments. Stains have been prepared to differentiate pulps produced by different processes and from various types of fibers. A method of analysis of dirt specks and the effective representation of results was likewise outlined. The measurements of fiber lengths and of particle size and their increasing significance were discussed. Numerous charts and graphs were used to amplify verbal descriptions while enlarged photomicrographs showed fibers and papers under a variety of conditions.

New Microscope

As a conclusion to his talk he exhibited and described in detail a new microscope specifically designed to meet the needs of the pulp and paper mill microscopist. This microscope is designed to give in a moderate priced instrument all of the facilities for conveniently and accurately making the many determinations which Mr. Graff discussed in his talk.

Those who attended were: F. L. Aldrich, Interlake Tissue Mills, Appleton; E. F. Anderton, Institute of Paper Chemistry, Appleton; S. I. Aronovsky, Institute of Paper Chemistry; H. E. Babcock, Mosinee Paper Mills, Mosinee, Wis.; L. R. Barlament, Appleton Woolen Mills, Appleton; W. C. Christensen, Hoberg Paper and Fibre Company, Green Bay, Wis.; D. P. Danielson, Tomahawk Kraft Paper Company, Tomahawk, Wis.; J. W. De Vos, Kimberly-Clark Corporation, Neenah, Wis.; David De Zurick, De Zurick Shower Company, Sartell, Minn.; G. F. Enderlein, Mosinee Paper Mills, Mosinee; G. A. Engert, Dilts Machine Works, Fulton, N. Y.; J. A. Extrom, Tomahawk Kraft Paper Company, Tomahawk; W. A. Fannon, Fannon, Trading Company; J. R. Fanselow, Kimberly-Clark Corporation, Neenah; A. T. Gardner, Combined Locks Paper Company, Combined Lock, Wis.; J. H. Graff, Institute of Paper Chemistry, Appleton; E. A. Gritmacher, Marathon Paper Mills, Menasha, Wis.; A. G. Hepburn, Tomahawk Kraft Paper Company, Tomahawk; Billy Herman, same company; Herb Heilig, Director of Vocational Education, Appleton; R. N. Hollands, Marathon Paper Mills, Menasha; T. H. Ireland, Crane Company, Chicago, Ill.; E. C. Jacobi, Standard Oil Company, Green Bay, Wis.; T. C. Jesdale, Monsanto Chemical Company, Chicago, Ill.; A. E. Johnson, Continental Paper and Bag Corporation, Marinette, Wis.; P. E. Jones, Patten Paper Company, Appleton; A. F. Kletzien, Fox River Paper Company, Appleton; Otto Kress, Institute of Paper Chemistry; Lloyd Lang, Kimberly-Clark Corporation, Neenah; J. D. Line, Mosinee Paper Mills; N. L. Malcove, Continental Paper and Bag Corporation, Marinette, Wis.; A. May, May Brothers Company, Green Bay; Rudolph Meyer, Badger Paper Company, Peshtigo, Wis.; C. H. Nystrom, Northern Paper Mills, Green Bay; P. A. Paulson, Appleton, Wis.; L. B. Penhallow, Wadhams Oil Company, Appleton; A. Phillips, Consolidated Water Power and Paper Company, Appleton; W. J. Plank, J. J. Plank and Company, Appleton; G. J. Ritter, Forest Products Laboratory, Madison, Wis.; Joseph Roskams, Hoberg Paper and Fibre Company, Green Bay; C. E. Saecker, Appleton Machine Company, Appleton; Alex Stoyanov, Appleton; W. F. Swan, Limestone Products Company, Menominee, Mich.; M. J. Taylor, Northern Chemical Company, Green Bay; A. H. Thuerer, Appleton Woolen Mills, Appleton; J. C. Tongren, Institute of Paper Chemistry; I. R. Valentine Jr., Fox River Paper Company, Appleton; J. A. Van den Akker, Institute of Paper Chemistry; E. J. Vicksman, Hoberg Paper and Fibre Company, Green Bay; Reinhold Vogt, Consolidated Water Power and Paper Company, Appleton; E. H. Voigtman, Kimberly-Clark Corporation, Neenah; H. L. Voss, Mosinee Paper Mills; A. G. Wakeman, Fox River Paper Company, Appleton; M. A. Youtz, Northern Paper Mills, Green Bay.

E. L. Puffer Convalescing at Chicago

Heller & Merz announce that their E. L. Puffer of Dayton, Ohio, is at the Passavant Hospital in Chicago convalescing from a recent illness. Mr. Puffer is expected to be back on the job again shortly.

N

Bell System Teletypewriter Service rushes BOXING orders from all points of the COMPASS for Robert Gaylord, Inc.

W E

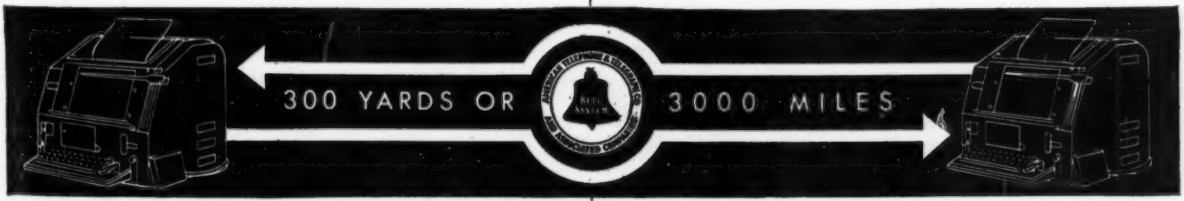
S

Robert Gaylord, Inc., makes corrugated and solid fiber boxes, employs Bell System Teletypewriter Exchange Service to link St. Louis headquarters with division offices in New York, Chicago, San Francisco — and with mills in Atlanta, New Orleans, Bogalusa, Dallas, Houston, and Long Island.

Close co-ordination of company activities is provided by connecting headquarters with all other points twice daily on a definite schedule. Orders, price changes, shipping instructions and general communications flash back and forth. Replies are received on the same connections.

Outstanding advantage of teletypewriter service to Gaylord is the speed with which rush orders reach the mills from far-away sales branches. In addition, the efficient, economical handling of normal interoffice traffic has strengthened the company's competitive position and improved customer service.

More than 80 other paper firms use Bell System Teletypewriter Service to meet their individual communication needs — find it a valuable investment. Probably your business would, too. Call the local Bell Company and talk it over. There is no charge or obligation, of course.



Government Paper Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 18, 1935—The Government Printing Office has announced the following paper awards bought on the open market.

The Paper Corporation of the United States will furnish 50,000 pounds of wood manila paper in 21-inch rolls at 3.25 cents per pound. Barton, Duer & Koch Paper Company will furnish 25,600 pounds of 34 x 44, 25 per cent rang white bond paper at 8.47 cents per pound and the Old Dominion Paper Company will furnish 16,300 pounds of 28 x 34, 25 per cent rag yellow bond paper at 8.61 cents per pound. Bids for these items were received on November 27.

John F. Post will furnish 80,000 pounds of 34 x 44, white sulphite bond paper at 6.06 cents per pound and Reese & Reese, Aetna Paper Company and Barton, Duer & Koch will furnish equally 150,500 pounds of 32 x 44 white sulphite bond paper at 6.06 cents per pound. The J. W. Butler Paper Company will furnish 40,000 pounds of No. 2, kraft wrapping paper at 3.79 cents per pound. Bids for these items were received on November 25.

The Whitaker Paper Company and the Paper Corporation of the U. S. will furnish 80.700 pounds of 38 x 48 single coated book paper at 7.35 cents per pound. The award was for equal amounts. Bids were received on November 22.

Barton, Duer & Koch Paper Company will furnish 48,725 pounds of white, cherry and yellow, 25 and 50 per cent rag ledger paper at $5,300.11. The Mathers-Lamm Paper Company will furnish 10,000 pounds of 24½ x 32 buff mimeograph paper at 6.45 cents per pound. John F. Post and the Aetna Paper Company will furnish equally 64,000 pounds of 34 x 44 white sulphite writing paper at $1,782.40 each. The R. P. Andrews Paper Company will furnish 57,000 pounds of 50 per cent rag white glazed manifold paper at 18.07 cents per pound. Dobler & Mudge will furnish 128,000 pounds of 34 x 44, 25 per cent rag yellow bond paper at 8.57 cents per pound and the Paper Corporation of the United States will furnish 92,000 pounds of 32 x 42, 25 per cent rag white bond paper at 8.24 cents per pound. Barton, Duer & Koch Paper Company will furnish 51,000 pounds of 28 x 34, 50 per cent rag white bond paper and 9,300 pounds of 21 x 32, 25 per cent rag green bond paper at 10.47 cents and 10.58 cents per pound respectively. The R. P. Andrews Paper Company will furnish 8,150 pounds of 28 x34, 25 per cent rag pink bond paper at 8.89 cents per pound. Bids for all of these items were received on November 20.

The Whitaker Paper Company will furnish 36,000 pounds of 41 x 52 single coated book paper at 6.35 cents per pound. Charles W. Beers & Company will furnish 11,625 pounds of 21 x 32, 25 per cent rag salmon bond paper at 10.98 cents per pound. The Whitaker Paper Company and Reese & Reese will furnish 10,000 pounds of 28 x 34, 25 per cent rag white ledger paper and 21,525 pounds of 21 x 32, 50 per cent rag white ledger paper at a total cost of $3,268.29. Bids for these items were received on November 18.

Reese & Reese will furnish 40,000 pounds of rope manila paper in 48-inch rolls at 10 cents per pound. The R. P. Andrews Paper Company will furnish 40,700 pounds of No. 2 kraft wrapping paper at a total cost of $1,619.28. L. Hyman & Sons will furnish 38,800 pounds of 21 x 32½ 50 per cent rag single ply buff index paper at 10.75 cents per pound. Barton, Duer & Koch Paper Company will furnish 52,550 pounds of 25 per cent rag yellow bond paper at a total cost of $5,386.27. Walker-Goulard-Plehn Company will furnish 5,000 pounds of 24 x 38, 100 per cent rag white ledger paper at 22.24 cents per pound and 4,960 pounds of 23 x 36 75 per cent rag buff ledger paper will be furnished and 5,000 pounds of 50 per cent rag buff index will be furnished by the same firm at 17.14 cents per pound and 11.85 per pound respectively. Bids for these items were received on November 8.

Barton, Duer & Koch Paper Company will furnish 32,250 pounds of 24 x 38, 50 per cent rag white bond paper at 10.73 cents per pound and the same firm will also furnish 12,800 pounds of 22 x 34, 25 per cent rag green bond paper at 8.95 cents per pound. Also 80,725 pounds of sulphite writing paper will be furnished as follows; Cauthorne Paper Company, 30,000 pounds at 6.54 cents per pound; Paper Corporation of the United States, 38,500 pounds at 6.57 cents per pound and 12,225 pounds by the Cauthorne Paper Company at 6.45 cents per pound. Bids for these items were received on November 15.

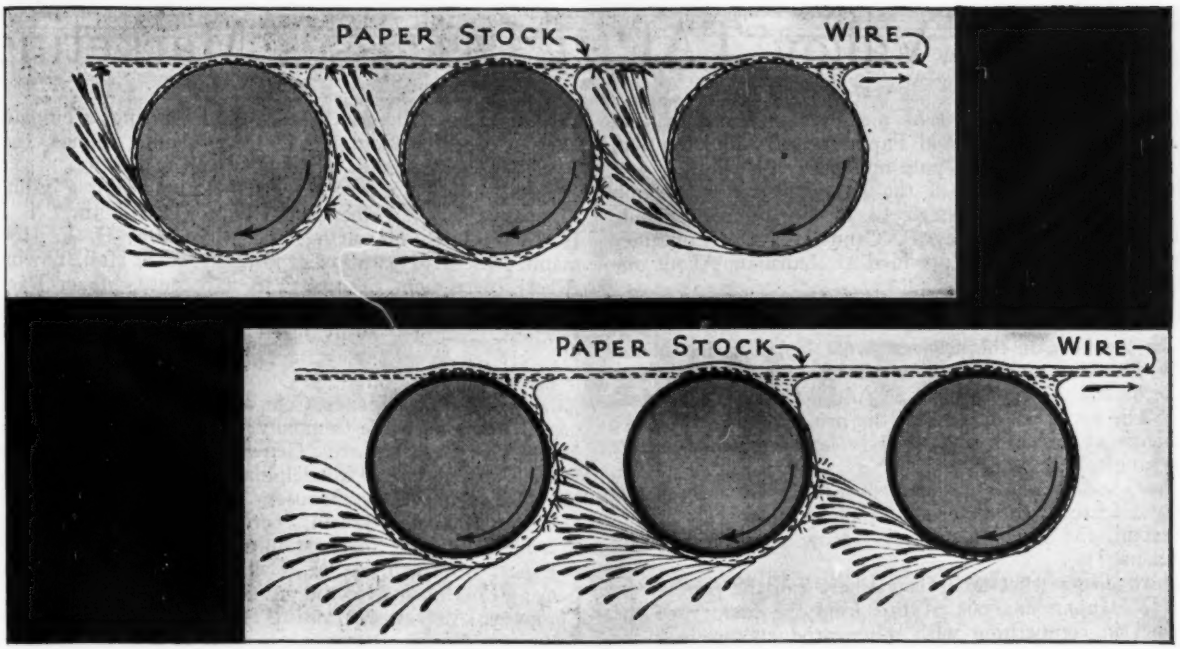
The R. P. Andrews Paper Company, the Paper Corporation of the United States and the Whitaker Paper Company will furnish equally 259,500 pounds of 38 x 48 supercalendered book paper at 5.5 cents per pound. Walker-Goulard-Plehn Company will furnish 116,400 pounds of 21 x 32½, 50 per cent rag single ply white index paper at 10.38 cents per pound. Barton, Duer & Koch Paper Company will furnish 36,903 pounds of 25 per cent rag salmon, blue and pink bond paper at a total cost of $3,658.87. Reese & Reese will furnish 2,000 sheets of 24 x 36 brown cloth lined cover paper at $14.14 per 100 sheets. Bids for these items were received on November 13.

John F. Post will furnish 57,400 pounds of 32 x 42 yellow sulphite writing paper at 6.54 cents per pound. The Whitaker Paper Company will furnish 65,200 pounds of 28 x 34 white sulphite writing paper at 5.57 cents per pound. The Aetna Paper Company will furnish 10,000 pounds of 21 x 32 white sulphite ledger paper at 16.54 cents per pound. An award at 6.06 cents per pound for 143,500 pounds of 32 x 42 white sulphite bond paper has been awarded equally between the following: Aetna Paper Company, Reese & Reese, Barton, Duer & Koch Paper Company and the R. P. Andrews Paper Company. Bids for these items were received on November 11.

The J. W. Butler Paper Company will furnish 256,000 pounds of 34 x 44 yellow sulphite writing paper at 6.3 cents per pound. The same firm will also furnish 64,000 pounds of 34 x 44 white sulphite bond paper at 5.82 cents per pound. The J. W. Butler Paper Company will also furnish 121,500 pounds of white sulphite writing paper at 5.33 cents per pound. The R. P. Andrews Paper Company will furnish 33,360 pounds of No. 2 kraft wrapping paper at 4.04 cents per pound. Bids for these items were received on November 6.

Charles W. Beers & Company will furnish 17,900 pounds of 33 x 43 white antique book paper at 5.25 cents per pound, bids for which were received on December 4.

The Aetna Paper Company will furnish 50,250 pounds of 25 and 50 per cent yellow bond paper at a total of $4,126.72. John F. Post will furnish 24,450 pounds of 28 x 34 white sulphite ledger paper at 6.54 cents per pound and 10,000 pounds of 28 x 34 yellow sulphite writing paper at the same price. The Mathers-Lamm Paper Company will furnish 100,000 sheets of 17 x 22, 40 pounds white gummed paper at $4.83 per M sheets. The Aetna Paper Company will furnish 37,750 pounds of 25 per cent rag pink and white bond paper at a total cost of $2,955.07.



TOP—Fig. 1—Brass Table rolls throw water up against the bottom of the wire.

BOTTOM—Fig. 2—Dukbak Table rolls throw water down, without disturbing formation.

WATER FROM TABLE ROLLS CHARTS YOUR PAPER COST

Examine the two illustrations above, then check the table rolls on your Fourdrinier. The water from those rolls can largely determine your paper costs.

If you are using rolls of brass, or other metals, note their tendency to throw water back, up into the bottom of the wire (as shown in Figure 1). This makes for waste due to a poorly formed and spotted sheet. The upward course of the water indicates a corresponding upward trend of production costs.

Contrast this with what happens when you use Goodrich Dukbak Table Rolls. With their low affinity for water, they carry water down, as shown in Figure 2. The result is an improved sheet formation free from spots, and waste is reduced. Here, the water charts a *downward* course for production costs.

Dukbak Rolls are ground to a uniform diameter more exact than is possible with rolls of other materials. The result is that they develop no high or low spots—the wire is kept level and so produces a uniform sheet.

Dukbak Rolls require little maintenance. Sealed ends keep out water and corrosion. Their special rubber cover makes them easy to straighten (if bent by dropping) so they will be good as new.

Goodrich paper mill specialists will be glad to demonstrate to you how Dukbak Table Rolls can chart a downward course for production and maintenance costs in your mill. Write for your free copy of "Modern Trends in Table Roll Construction," by E. Peterson. The B. F. Goodrich Company, Mechanical Rubber Goods Division, Akron, Ohio.

ROLL COVERINGS · BELTING · HOSE · MISCELLANEOUS RUBBER PRODUCTS

Goodrich ALL *products problems* IN RUBBER

DUKBAK *Rubber Table Rolls*

Delaware Valley TAPPI Discusses Marketing

The expanding interest of members of the Technical Association of the Pulp and Paper Industry into the field of sales engineering and pulp and paper distribution was reflected at the meeting of the Delaware Valley Section on Friday evening, December 13, at the Engineers' Club, Philadelphia, Pa. Harvey P. Cannon of the Container Corporation of America presided as chairman. About one hundred were present.

The Problems of Selling

The speakers on the program were Roland Ullman and F. W. Hankins, marketing counsellors of Philadelphia, who spoke on the subject "Who Can Add a Cubit to His Market." The speakers stated that the problems of selling are problems of research and need to be approached in the following ways.

First, need for product analysis (What are the properties and features characteristic of the product?).

Second, the function analysis (How does the product act in use?).

Third, the market analysis (Where can the product be used?). In an analysis of this kind the history of the product in competition with other products needs to be reviewed. What is the history of the executive and sales personnel of the company? How has the policy regarding the sale of the product changed with time. How have style demands changed? What has been the profit record?

In organizing sales effort, research in orientation is necessary. Where should selling be done? Who are the big prospects? The sales records will show the relative value of prospects. It is important to devote more time to the biggest customers. Less travel and more concentration on worth-while prospects is needed. Most companies will find that a certain small proportion of their customers buy a large percentage of their product. This fact should have an influence in the policy of routing salesmen. It is possible to forecast sales month by month when good records of past sales are known. Most businesses have peak sales loads at certain seasons. These peaks can usually be taken care of by the proper reapplication of time and effort.

In working out the sales plan there is first a need for co-ordinating the functions of advertising, research, manufacturing, shipping, having once decided on such policies as selling direct, through jobbers, by means of reciprocity, etc. Yardsticks need to be developed that decide where to apply the greatest effort. This may be accomplished and proved in selected test territories.

It must be remembered that people buy a product principally because of its utility value and not because of gadgets and special features. In working out a marketing program it should be kept in mind that the profit expected is part of the budget.

Among Those in Attendance

Those present included:

Raymond E. Aiman, Norristown, Pa.; Robert W. Ball, Krebs Pigment and Color Corporation; R. Bow, A. M. Collins Manufacturing Company; Samuel R. Bradley, A. M. Collins Manufacturing Company; D. H. Bigelow, R. G. E. Ullman Organization; C. R. Beeson, Riegel Paper Corporation; F. Irving Crow, National Vulvanized Fibre Company; F. W. Campbell, National Vulcanized Fibre Company.

H. C. Cannon, Container Corporation of America; James d'A. Clark, Scott Paper Company; A. M. Cooper, Westinghouse Electric and Manufacturing Company; N. C. Cooper, Dupont; L. F. Derr, Goulds Pumps, Inc.; Paul W. Dieffenderfer, Riegel Paper Corporation.

Jacob Edge; James H. Fritz, National Oil Products Company; L. A. Gilbertson, Dill & Collins, Inc.; J. R. Howarth, J. R. Howarth Paper Company; H. F. Hoffmann, General Dyestuffs Corporation; A. S. Hall, Thwing-Albert Instrument Company; S. Houloose, Mazer Paper Mills; Garrett F. Hom, Messinger Bearings, Inc.; H. C. Hackett, National Vulvanized Fibre Company; J. C. Harper, Jr., West Jersey Paper Manufacturing Company.

Leslie Justice, Container Corporation of America; Paul Koenig, P. H. Glatfelter Company; G. E. Landt, Continental-Diamond Fibre Company; S. C. Long, Mazer Paper Mills; George B. Martin, General Dyestuff Corporation; Russell Morehouse, Philadelphia Quartz Company; Geo. H. McGregor, Weyerhaeuser Timber Company, Pulp Division; R. G. Macdonald, Secretary of TAPPI; William Marble, Container Corporation of America.

Ernest O. Nash, A. M. Collins Manufacturing Company; Franklin R. Newton, A. M. Collins Manufacturing Company; Andrew L. Pontius, Container Corporation of America; C. E. Peterson, Riegel Paper Corporation; Charles H. Pritham, Technical Director, Frankford Arsenal; Joseph R. Pekora, Dill & Collins, Inc.; Walter P. Quinn, Container Corporation of America; Otto W. Renner, J. R. Howarth Paper Company; C. W. Richards, Krebs Pigment and Color Corporation; Jay Robinson, National Vulcanized Fibre Company; C. W. Rivise; David S. Raub, Dill & Collins, Inc.; Tom C. Robinson, Dill & Collins, Inc.

Howard H. Street, National Vulcanized Fibre Company; W. M. Shoemaker, National Vulcanized Fibre Company; C. R. Swett, Container Corporation of America; Adolf Shnabel, Mazer Paper Mills; G. L. Schwartz, E. I. du Pont de Nemours; C. F. Schultheis, A. M. Collins Manufacturing Company; Emerson N. Slauner, Downingtown Manufacturing Company; Chas. A. Shubert, Dill & Collins, Inc.; H. C. Schwalbe, Dill & Collins, Inc.

Roland G. E. Ullman, R. G. E. Ullman Organization; F. W. Varden, Barber Asphalt Company; Simon Walter, S. Walter, Inc.; A. W. Wickham, MacAndrews & Forbes Company.

Guy S. Wood Named Fibre Co. Manager

HERKIMER, N. Y., December 16, 1935—Guy S. Wood, who for several years has been connected with the engineering department of the International Paper Company, has been appointed manager of the Herkimer Fibre Company, this village, to fill the vacancy caused by the death of Fred D. Gray. Mr. Gray, who died suddenly, November 9, of heart disease, had been in the employe of the Herkimer Fibre Company for 40 years, the last 15 years as manager.

Walter Cunningham Goes with Wausau Mills

Walter Cunningham, for several years with the Mead Company, and more recently with the Bryant Paper Company, has accepted the position as superintendent of the Wausau Paper Mills Company at Brokaw, Wis. Mr. Cunningham is widely known in the paper industry, and is recognized as one of the best paper mill executives in the industry.

Felt Life Jumped from 18 to 70 days in Newsprint Mill because of . . .

TENSILASTIC

Rubber Covered Suction Roll

That's news from a newsprint mill worth shouting about. •Another saved 15c a ton on its felts. •Another saved the cost of the Tensilastic rubber covering in a year.

Three newsprint mills. We could tell you of many other instances of almost unbelievable Tensilastic Suction Roll savings over brass rolls.

Again and again, wherever they are used, Tensilastic superiority proves itself.

But that is to be expected. Tensilastic is a superior rubber covering. It's the result of years and years of research, experimentation, testing and development. Such a covering isn't the product of a day or a week or a year. It doesn't happen accidently. It takes *years* to develop a compound like Tensilastic.

Above all things, Tensilastic has correct Modulus—the measure of elastic rebound. It has the ability to snap back to normal quickly after pressure. A characteristic necessary for long life and efficient performance. For, a roll that is slow to rebound at the nip soon becomes corrugated and distorted.

Install a Tensilastic rubber covered Suction Press Roll and you'll know what it means to increase your felt life. You'll also find, you can use a more open and less expensive type of felt with a Tensilastic Rubber Covered Suction Roll—another worthwhile saving.

Get your Tensilastic Suction Roll through your machinery builder. But, be sure to specify Tensilastic, for you can't get Tensilastic results with an ordinary rubber covered Suction Roll.

American Wringer Company, Inc.

Rubber Roll Specialists for nearly 50 Years

WOONSOCKET, R. I. FARNHAM, QUEBEC

33 No. La Salle St., Chicago 267 Fifth Ave., New York

Pacific Coast Representative: Walter S. Hodges, Terminal Sales Bldg., Portland, Ore.

TENSILASTIC
RUBBER ROLLS

T-75 REG. U. S. PATENT OFFICE

Kalamazoo TAPPI Discusses Printing

Kalamazoo Valley Section of the Technical Association of the Pulp and Paper Industry, held a dinner meeting Thursday, December 12, at 6:30 p.m., at the Park American Hotel in Kalamazoo. Seventy members were present.

January Meeting Program

In opening the meeting Chairman H. M. Annis announced that an exceptionally fine meeting has been arranged for January 16. Speakers will be Jacob Kindleberger, of Kalamazoo Vegetable Parchment Co., and C. E. Curran, of the Forest Products Laboratory. Ralph Hayward, Kalamazoo Vegetable Parchment Co., will be master of ceremonies. This meeting is expected to be of interest to technical men, foremen, and executives engaged in the paper industry.

Printing Ink Manufacture

Chairman Annis then introduced F. Jack Jeuck, of the International Printing Ink Corp., Battle Creek, who spoke on the "Manufacture of Printing Inks." Mr. Jeuck discussed ink ingredients, including pigment, vehicle, extenders, and driers, and described the function of each. He outlined the mechanics of ink drying by oxidation, evaporation and absorption, and predicted that in the future inks dried by evaporation would play an increasingly important part. The speaker touched on problems involved in the manufacture of specialty inks such as soap wrapper inks and Parchment inks. He also outlined some of the tests used in controlling ink manufacture.

Printing Requirements of Paper

The second speaker, John Niemczyk, of the W. F. Hall Printing Company, Chicago, on the subject "Printing Requirements of Paper," stressed a need of a scientific foundation for instrumentation in evaluating properties of paper to be used for printing. He outlined some of the important paper characteristics, such as weight, thickness, formation, density, smoothness, opacity, tendency to curl, and fuzz, and explained methods of testing for these properties and their effect upon printing. He stated that uniformity was the most desired characteristic in a sheet of printing paper.

The speaker stated that, in evaluating a sheet, tests found to be useful had been smoothness tests, oil absorption tests, surface examination with a binocular microscope, and comparative proof-press tests. Both speakers spent considerable time in answering questions by the members of the group.

Among Those Attending

Those in attendance were:

John Niemczyk, W. F. Hall Printing Company; H. M. Annis, Allied Paper Mills; F. Jack Jeuck, International Printing Ink Corporation; Frank Libby and Harry Boldman, Kalamazoo Vegetable Parchment Company; Karl M. Thorsen, Wm. J. Dial and H. J. Hotz, Central Paper Company; Paul de Guehery and A. E. Hays, Michigan Paper Company; S. H. Myers and D. D. Bachelder, Sutherland Paper Company.

Ray Olson and William Randall, Bryant Paper Company; Norman J. Cowie, Hawthorne Paper Company; Otto Fisher, Bryant Paper Company; R. B. Stewart and Lester LaLiberte, Kalamazoo Vegetable Parchment Paper Company; H. E. Stafford and E. M. Cowling, Hawthorne Paper Company; E. J. Turner, Paper Makers Chemical Corporation; Carl C. Schneider, Hawthorne Paper Company; Harold Doyen and Ivan Randall, Allied Paper Mills; R. H. Hurst, Kalamazoo Vegetable Parchment Paper Company.

Ralph Bunto, Bunto Printing Company; E. A. Radant and A. C. Dreshfield, Paper Makers Chemical Corporation; F. Fisher, Allied Paper Mills; Dwight Stocker, Michigan Paper Company; Fred Chappell and C. E. Mueller, Paper Makers Chemical Corporation; W. K. Child, Clinton Company; James Wise, Kalamazoo Paper Company; M. F. Flotow, French Paper Company; Forrest Anderson, Wilkens-Anderson; Al Sherwood, Sutherland Paper Company; Roger Egan, Bulkley, Dunton and Company.

E. J. Kelly, E. J. Kelly Company; G. B. McAlister, P. Billiam, L. A. Willoughby, V. C. Mathis, A. DePew and Noah W. Bryant, Bryant Paper Company; H. S. Faram and Elbert G. Milham, Watervliet Paper Company; G. F. Des Autels, Kalamazoo Vegetable Parchment and Paper Company.

H. M. Eastman, Paper Makers Chemical Company; E. F. Whittington, Rex Paper Company; Arthur Weinland and Ralph Atkins, Lee Paper Company; W. F. Hathaway, Kalamazoo Vegetable Parchment Paper Company; M. D. Bardeen, Lee Paper Company; F. C. Stamm, The Armstrong Machine Works; Harry Bradford, Rex Paper Company; Archie Webb, Roy Kendall and A. B. Milham, Bryant Paper Company; W. J. White, John Bauman and Hugh Smith, Kalamazoo Vegetable Parchment Paper Company; Ray Barton, Michigan Paper Company; Merle Wilkins, Bryant Paper Company; Eugene McCauliff, Hooker Electrochemical Company; J. C. Widmeyer, Jack Haines and J. E. Dennany, Allied Paper Mills; M. Redmond, Kalamazoo Paper Company.

To Buy Electricity from City Plant

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., December 17, 1935—The American Writing Paper Company, Inc., has been granted permission by Judge Hugh D. McClellan of the Federal District Court of Boston to take electric power from the city lighting and power plant instead of from the Holyoke Water Power Company plant. The water power company took the contract away from the city plant ten years ago.

The city plant management recently announced a new schedule for power users bringing down the cost of large quantities of power to the very largest users to eight mills net per kwh. The permit is good for one year.

The American Writing Paper Company paid the Holyoke Water Power Company about $35,000 for electric power last year being the largest users of electric power in the city.

American Writing To Pay Tax

HOLYOKE, Mass., December 17, 1935—The Federal District Court at Boston has granted permission to the American Writing Paper Company, Inc., to pay their 1935 taxes amounting in round figures to $190,000. There had been no doubt of the ability of the Company to pay, but as the Company is in the hands of the Federal Court pending reorganization, it became necessary to secure a court order for their payment.

J. P. Heilbronn in New York

J. P. Heilbronn, president of J. P. Heilbronn Company, Manila, Philippine Islands, arrived in New York City last week after a three months' trip to Australia, New Zealand, Panama and Havana. Mr. Heilbronn will be at his office at 16 Beaver street, New York City for several weeks.

LES COULEURS DE KREBS AUGMENTENT LA BLANCHEUR, LE LUSTRE, ET L'OPACITÉ DU PAPIER
LOS PIGMENTOS DE KREBS ACRECENTAN LA BLANCURA, EL LUSTRE Y LA OPACIDAD DEL PAPEL
LE SOSTANZE KREBS AUMENTANO IL BIANCO, IL CHIARO E NELLO STESSO TEMPO L'OPACITÀ DELLA CARTA
KREBS FARBSTOFFE ERHÖHEN DAS WEISSE, DEN GLANZ UND DIE FESTIGKEIT DES PAPIERES
KREBS PIGMENTS INCREASE THE WHITENESS, BRIGHTNESS AND OPACITY OF PAPER STOCK
IT'S THE SAME in any language

KREBS

REG. U.S. PAT. OFF.

PIGMENTS FOR PAPER

MAIN OFFICE: 1007 Market Street, Wilmington, Delaware

PLANTS: Newark, N. J. Edge Moor, Del. Newport, Del. Baltimore, Md.

THERE'S A KREBS PIGMENT FOR ALL TYPES OF PAPER

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

New Orleans, La.—The Johns-Manville Corporation, 22 East 40th street, New York, N. Y., manufacturer of asbestos paper products, insulating board and kindred specialties, has concluded negotiations for purchase of a tract of about 60 acres of land in Jefferson Parish, vicinity of New Orleans, fronting on the Mississippi River, as site for new plant. It will consist of several units, with initial main structure to be one-story, 150 x 800 feet. Plans for this building will be placed under way at once and it is expected to begin superstructure early in 1936. It will be equipped to give employment to about 400 operatives in different departments. Company is now operating a branch mill at Gretna, La., and it is proposed to consolidate this works with the new plant, as soon as latter is ready for occupancy. The Gretna mill is now employing approximately 75 persons; equipment from this plant will be transferred to new plant, which will have over five times the capacity. Entire project is estimated to cost over $650,000. S. A. Williams is vice-president, in charge of mines and factories.

Lee, Mass.—Smith Paper, Inc., manufacturer, tissue and other paper, has completed plans and is asking bids on general contract for two new additions to mill in the Hinsdale district, near Lee, each one-story, to be used for expansion in machine department and finishing division, respectively. Expansion is reported to cost in excess of $60,000, including equipment. Company engineering department will be in charge of project.

Long Island City, N. Y.—The Great Eastern Packing and Paper Stock Corporation, 250 Park avenue, New York, has concluded arrangements for lease of two-story building at 44th road and 24th street, Long Island City, formerly occupied by the Garford Motor Truck Company, and will take immediate possession for a new storage and distributing plant. Structure totals about 50,000 square feet of floor space, all of which will be used by Great Eastern Company. An option has been taken to purchase the property at a later date. It is understood that company will remove one of its present plants to the new location.

New York, N. Y.—The Acme Folding Box Company, 137 Wooster street, manufacturer of folding paper boxes and containers, has arranged for lease of space in building at 141 East 25th street, totaling about 45,000 square feet of floor space, and will occupy for new plant. Present works will be removed to new location, where increased facilities will be provided.

Dayton, Ohio—The Loose-Wiles Biscuit Company, Commerce Building, Kansas City, Mo., is awarding miscellaneous contracts for new branch plant on Concord street, near Riegel street, Dayton, to include a large division for the manufacture of paper cartons and containers for company products, as recently referred to in these columns. Contract for steel frame superstructure has been awarded to the Pittsburgh Bridge & Iron Works, Fulton Building, Pittsburgh, Pa., and this work will soon begin. New unit will be one-story and basement, approximately 75 x 650 feet, and is estimated to cost about $160,000, including equipment. General contract was awarded recently to the H. K. Ferguson Company, Hanna Building, Cleveland, Ohio.

New York, N. Y.—The Karl Manufacturing Company, Inc., recently organized with capital of $2000, will take over and operate company of same name at 64 West 36th street, manufacturer of paper products of various kinds. New company is represented by Albert Adams, 1619 Broadway, New York.

Enka, N. C.—The American Enka Corporation, 271 Church street, New York, N. Y., manufacturer of cellulose rayon products, plans extensions and improvements in mill at Enka, near Asheville, including building betterments, installation of new equipment for replacements in certain existing machinery, and other work. Program will be carried out during 1936, and is reported to cost close to $500,000, with machinery. A. J. L. Moritz is vice-president.

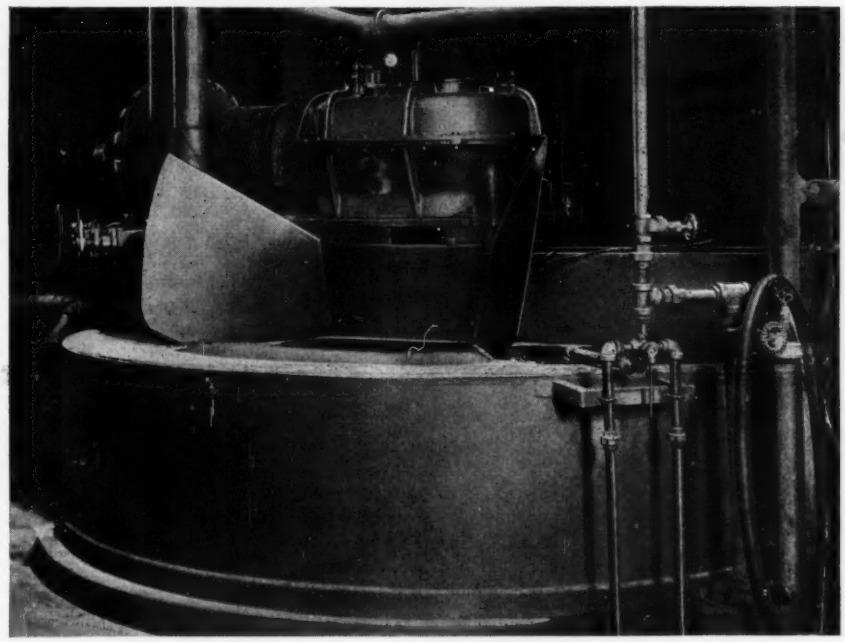
Hinsdale, N. H.—The Hinsdale Paper Manufacturing Company, manufacturer of tissue paper stocks, etc., has engaged McClintock & Craig, 458 Bridge street, Springfield, Mass., consulting engineers, to prepare plans for proposed rebuilding of mill, recently destroyed by fire, as previously reported in these columns. It is proposed to have plans ready for estimates at early date. The fire loss at the mill approximated $200,000, including equipment, and reconstruction is expected to cost close to a like sum. Louis N. Stearns is treasurer and general manager.

St. Louis, Mo.—The Celucoating Company of St. Louis, Inc., recently organized with capital of $30,000, plans operation of local plant for coating of paper products of various kinds. Alan A. Atchison, 5616 Bartmoor avenue, is one of the principal incorporators.

Camden, Ark.—Bagpak, Inc., 220 East 42nd Street, New York, N. Y., manufacturer of heavy paper bags and containers, has work nearing completion on new branch mill in Cullendale district, Camden, previously referred to in these columns, and expects to have the unit ready for service early in 1936. New unit is one-story, 110 x 300 feet, and will represent an investment of close to $150,000, with machinery. It will use paper stocks from the local mill of the Southern Kraft Corporation, an affiliated interest, and will make a specialty of glued paper bags for handling cement and kindred heavy materials. Both companies are subsidiaries of the International Paper Company, first noted address.

Holyoke, Mass.—Holyoke Water Power Company, 1 Canal street, has asked bids on general contract for new

VORTEX



VORTEX

A NEW CHAPTER IN BEATER HISTORY

The Vortex Beater revolutionizes modern beating. It offers advantages which establish entirely new standards in beater performance and cost of operation. Here are five of these revolutionary advantages:

1. **25 to 50% power saving**
2. **Disintegrates ton of soft laps in 3 minutes**
3. **Cuts beating cycle in half**
4. **Increases circulation speed 7 times**
5. **Defibrates ton of hard sheets in 20 minutes**

Write for further specific details

45 YEARS OF BEATER-BUILDING EXPERIENCE

VALLEY

IRON WORKS COMPANY

Plant: Appleton, Wisconsin

New York Office: 350 Madison Ave.

Canadian Representatives: Pulp & Paper Mill Accessories, Ltd., Montreal, Canada

steam-generating equipment, in connection with proposed expansion program at power plant, for power service for paper mills in this vicinity. It is proposed to begin work on the project early in 1936. Arthur L. Nelson, 31 St. James avenue, Boston, Mass., is consulting engineer.

Chicago, Ill.—The Marquette Paper Company, 517 South Wells street, has awarded general contract to the Robert C. Regan Company, 228 North LaSalle street, for alterations and improvements in plant. No estimate of cost has been announced. Weschelberger & Charn, 820 Tower Court, are architects. Work will be placed under way at once.

Canton, N. C.—The Champion Fibre Company has work under way on construction of first unit of new filter plant at local mill, used for production of writing paper stocks, kraft and other papers, estimated to cost close to $100,000, with equipment. Other units will be built to the filter station early next year, entire installation being estimated to cost over $400,000. Reuben B. Robertson is president and general manager.

Springfield, Mass.—The United States Envelope Company is developing increased capacity at local mill for the manufacture of a new type self-sealing envelope, and is running on a 24-hour production basis, working on three eight-hour shifts, in portions of the mill. Company has approved plans for construction of new special machinery and auxiliary equipment for the new line of output and will carry out installation the early part of 1936, providing for considerable advance in present output.

Hamburg, N. J.—The Hamburg Waxed Paper Company, Inc., recently organized with capital of $100,000, to manufacture waxed and processed papers, is said to be planning to take over the former local mill of the Union Waxed and Tissue Paper Company, Inc., dismantled some time ago. It is proposed to remodel and improve the building and install new equipment, having unit ready for service at early date. Chester R. Ulrich, Hamburg, is one of the incorporators and company representative.

Indianapolis Shows Improvement

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., December 16, 1935—Most of the paper trade here is preparing to close the year's business. Inventories have not begun as yet, but they will be made before the end of the year and from all available reports, the year will show a decided improvement over the year before. Credit conditions have improved notably, and more and more customers are buying sufficiently ahead to take advantage of credit facilities. At one time last year a large volume of buying was of the cash and carry variety, with small orders being paid for at the time of delivery.

Demand for fine paper the past week held up well. The approach of the holiday season has caused a considerable demand for writing papers and similar merchandise. Demand for books and covers also has held up well and prices in the entire fine paper field are being maintained. In fact the price situation in fine papers seems to be much better than in some other grades.

A good volume of waxed and transparent papers continues. Prices for waxed papers are not entirely satisfactory, according to some local manufacturers, but they are blaming the situation on outside influences, rather than themselves.

Box manufacturers continue operations with curtailed production schedules, but production is expected to be stepped up slightly between now and the end of the year. Warehouse stocks have been badly depleted and a continued demand will force production upward. Demand from the textile and hardware trade continues to be good and the automobile accessory factories are expected to be in a buying mood immediately after the first of the year. It is known that some of them have large orders to be finished.

Paper stock men report a trifle heavier mill demand. For the most part paying prices are not satisfactory, but the level is higher than it was a year ago.

Alexander Calder Speaks at Atlanta

SAVANNAH, Ga., December 16, 1935—The general business outlook is particularly favorable both from near and long-term viewpoints, Alexander Calder, president of Union Bag and Paper Corporation, declared last week in addressing members of the Savannah Civic Clubs at the complimentary luncheon marking progress of construction on Union Bag's new $4,000,000 paper making plant here. Facilities provided by the new plant will render the corporation entirely independent of other sources for its supplies, and give Savannah the distinction of becoming one of the most important paper manufacturing centers in the south.

Mr. Calder disclosed that so active has been the demand for the corporation's products in recent years and so urgent the need for new sources of supply, that orders have actually been refused in considerable volume pending expansion of facilities. At the same time he gave the opinion that within twenty-five years the center of paper manufacturing in the United States will have been shifted from northern and eastern to southern states, because of the abundance and suitability of woods and because growth of timber in the south is three to four times as swift as in the northern states and in Canada.

"I am more bullish on the future than when we decided to build this mill," he asserted. Mr. Calder voiced a criticism of a phase of the proposed "social security" program.

Mr. Calder outlined the history of the corporation, since its organization in Pennsylvania in 1869, and of the paper bag manufacturing industry generally. Union Bag's orders for paper bags alone are currently at the rate of about $10,000,000 annually, he said.

In conclusion, Mr. Calder observed that while many experts were predicting another crash of prices and business activity ultimately, as a result of the vast debt being piled up by the Federal Government, it should be "borne in mind that the Savannah mill is depression-proof because kraft paper consumption has increased almost 50 per cent since 1929 and the Savannah mill cannot supply the company's bag factory requirements even during a depression."

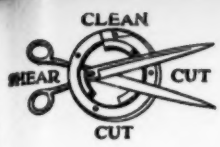
Samuel Dauman Elected Vice President

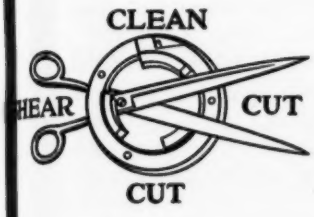
Gottesman & Co., Inc., 22 East 40th street, New York, N. Y., announce the election as of December 2, 1935, of Samuel Dauman as vice president in charge of sales. The official personnel of the company now is as follows:

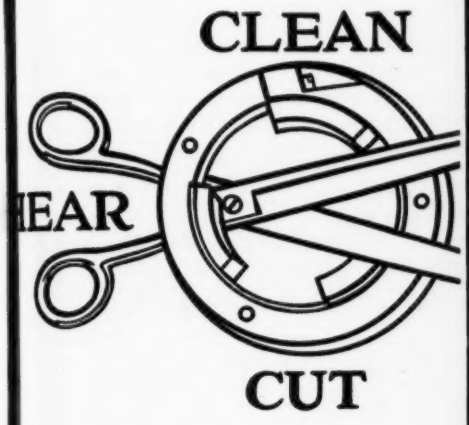
D. Samuel Gottesman, president; Arthur J. Sigel, vice president; Samuel Dauman, vice president; Benjamin I. Sheldon, treasurer; Benzion Emanuel, secretary.

New Officers of Tayloe Paper Co.

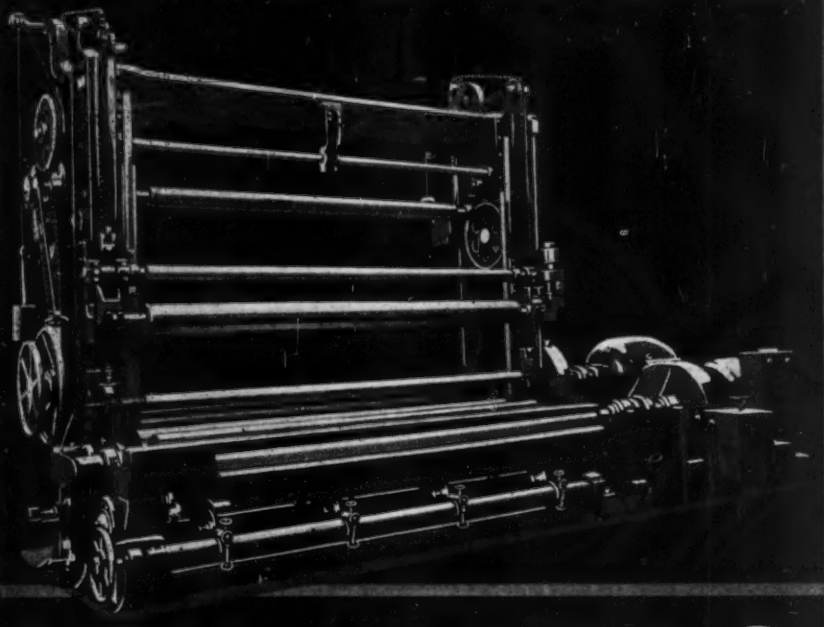
At a recent meeting of the board of directors of the Tayloe Paper Company of Memphis, Tenn., Howard Tayloe was elected vice-president and secretary, and Gentry C. Carroll, vice-president. Dudley Forsmark was appointed manager of the fine paper department. All of these men have been with the company a great many years.



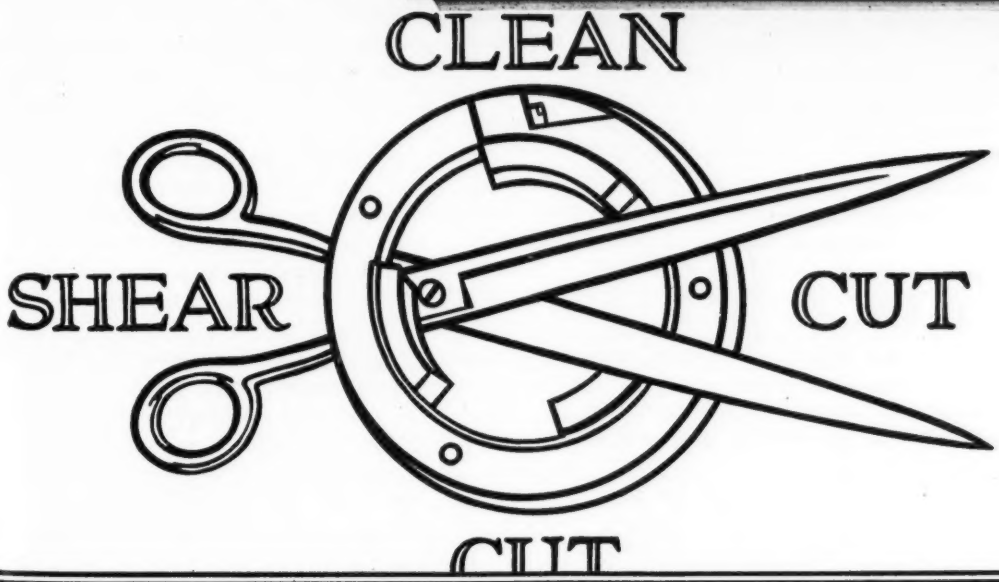




WINDERS *and*



REWINDERS



Samuel M. Langston Co., CAMDEN, N. J.

PAPER TRADE JOURNAL
ESTABLISHED 1872

15 West 47th St., New York, N. Y.

Henry J. Berger
Editor

Ronald G. Macdonald
Editor Technical Section

Herbert J. Laughton
Associate Editor

Thomas J. Burke, C. A.
Editor Cost Section

Lynne M. Lamm
Washington Correspondent

Price, Per Copy, 10 Cents
Canada, $7.50; after Jan. 1, 1936, $6.00.

United States, Per Annum, $4.00
Foreign Countries in Postal Union, $6.00

Member Audit Bureau of Circulations

Vol. CI New York, December 19, 1935 No. 25

COMING EVENTS IN THE PAPER INDUSTRY

AMERICAN PAPER AND PULP ASSOCIATION, Fifty-Eighth Annual Convention and Meeting, Waldorf-Astoria Hotel, New York, February 17-21.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Convention, Waldorf-Astoria Hotel, New York, February 17-20. Annual Luncheon, Waldorf-Astoria Hotel, Thursday, February 20.

SALESMEN'S ASSOCIATION OF THE PAPER INDUSTRY, Annual Meeting and Luncheon, Waldorf-Astoria Hotel, New York, Tuesday, February 18.

NEW YORK ASSOCIATION OF DEALERS IN PAPER MILL SUPPLIES, Annual Banquet, Hotel Commodore, New York, February 19.

NATIONAL PAPER TRADE ASSOCIATION OF THE UNITED STATES, Convention, Waldorf-Astoria Hotel, New York, February 17-21.

CANADIAN PULP AND PAPER ASSOCIATION AND SECTIONS, Annual Meeting, Montreal, January 29-31.

TECHNICAL SECTION, CANADIAN PULP AND PAPER ASSOCIATION, Annual Meeting, Montreal, January 29-31.

MERRY CHRISTMAS

The PAPER TRADE JOURNAL wishes its subscribers, its advertisers and its friends everywhere the compliments of the season. It hopes that this Christmas may be a very merry one for all of them. It is good to know that the improvement in business conditions recently in every branch of the industry will, more fully than in many years past, help toward the good cheer that is expected at this time.

The Standard Statistics Company, the well-known statistical authority, says that "production of all primary grades of paper, including newsprint and paperboards, for the first eight months of 1935 was approximately 13 per cent larger than for the similar period of 1934. Indications point to further gains during the final months of the year, and total 1935 production will probably exceed that for 1934 by about 15 per cent.

"According to reports to the American Paper and Pulp Association, preliminary figures for October showed the paper industry operating at about 75.8 per cent of capacity, as against 64.8 per cent for the similar month of 1934. For the first ten months of the year, operations approximated 70.7 per cent of capacity. No direct comparison with 1934 is available, but it is indicated that operations thus far in 1935 have utilized between 10 per cent and 15 per cent more capacity than those in the similar period of last year. Since operations at 82 per cent of capacity are generally regarded as representing peak activity, the industry as a whole has materially improved its position and, on the basis of volume, operations are now at a relatively satisfactory rate."

These are encouraging statistics. Judging from all the indications, it seems reasonable to believe that prosperity generally will continue to increase.

That pulp and paper men will share abundantly in the betterment is earnestly wished at this happy season by the PAPER TRADE JOURNAL.

TRAINING SUPERVISORS AND KEY-MEN

The growing attention being given to employer-employee relations has served to focus attention on foremen and other supervisory employees because of their key position between management and the rank and file of the organization. This explains why, according to a report recently issued by the Policyholders Service Bureau of the Metropolitan Life Insurance Company, increasing emphasis is being placed on the training of such supervisors as foremen and the other "non-commissioned officers" of managerial staffs. A report of the survey, entitled: Training Supervisors and Key-Men, presents an outline of the practices of 85 companies that have inaugurated such training programs.

A clearly defined purpose is essential to the success of training programs, the report points out. Analysis of the training methods of the 85 companies shows that there are three predominating objectives: (1) providing foremen with an opportunity to acquire information; (2) helping them to think clearly about their jobs and (3) developing ability in doing what is required of them. Methods of training discussed in the report vary from the studied informality of the "conference" method to schedules of lectures on such subjects as economics, psychology, time study and cost accounting, also on company organization and history, products and markets, plant policies and practices.

The report, referring to discussions used in connection with training lectures, states that it has been found that information acquired through such methods is better understood and more readily accepted.

The essentials for success in a program of foreman training, according to information in the report, are active interest from the management, a competent leader, a carefully selected group, practical subjects for discussion. The report states that there is difference of opinion as to the possibility of measuring results of training programs. Some companies however, point to specific improvements in departmental production, to changes in attitude of certain foremen, or to the fact that trained foremen have developed faster as a group than those who have not received training.

The report also discusses methods of planning a training program, and the costs of a training program. The details of the practices of seven companies are outlined at some length.

Construction in the Paper Industry

Exacting demands by the users of paper and pulp products for materials properly conditioned for use in printing or processing presage far-reaching construction activity in these industries in 1936, according to George A. Bryant, Jr., executive vice-president of The Austin Company, national organization of industrial engineers and builders.

"The past year has witnessed the application of air-conditioning in a number of new warehouses for the storage of paper," Mr. Bryant said. "Competition for their business is bound to result in the extension of air-conditioning among other producers of carefully graded stock.

"Appreciation of the importance of properly conditioned paper among printers has been accompanied by increasing consciousness of the need for controlled conditions in printing plants themselves.

"The progress in color printing and growing use of off-set methods makes uniformity of graphic production increasingly difficult in the absence of perfect temperature and humidity controls. These trends would indicate that printing plants and paper storage may become the first completely air-conditioned fields in industry.

"The general outlook for industrial construction in 1936 indicates that industry as a whole anticipates a broad expansion of markets which should be reflected directly in the demand for paper and pulp products. The extent to which individual producers will share in the profits now in prospect depends upon the extent to which their facilities have been adapted to changed competitive conditions which are throwing an entirely new emphasis upon quality and price.

"Manufacturers generally have come to realize that all non-essential operating and distribution costs not only impede corporate gains but limit the ultimate volume of demand by erecting price barriers that consumers can or will not hurdle. This realization has prompted far-sighted executives to abandon plants and equipment still good for years of service, when they see that these assets only perpetuate excessive costs.

"New plants erected in their stead have the advantages of strategic location with respect to raw materials, markets and labor. They have a flexibility which permits profitable operations while running at fractional capacity and can be adapted to any given volume or change of business with minimum expense. Beyond this, complete control of physical as well as mechanical conditions inside the plants affords a basis for harmony and efficiency among employees which is difficult to maintain in older, high-cost structures."

W. N. Berry Returns to England

VANCOUVER, B. C., December 14, 1935—Completing a tour of every large pulp and paper development in the Dominion of Canada, W. Neville Berry, of Edward Lloyd Ltd., newsprint manufacturers of Kent, England, recently left Vancouver by air for Los Angeles and New York, from whence he will sail for England after four months in Canada. While at Vancouver he visited the plant of the Powell River Company.

Mr. Berry expressed concern over advice received that some Eastern Canadian mills were marketing newsprint in England at $5.00 per ton less than the current English price.

He stated that his firm has just completed installation of a new and all British paper making machine, which was the largest in the British Empire, turning out paper 320 inches wide. His own company uses Russian spruce, he stated, but only does so because of price. The newsprint market in England has remained very low, probably the lowest in the world, and manufacturers have to use the least expensive raw materials.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES

1934	Total Production Ratio	1935	Total Production Ratio
January	.....	January	65.8%
February	.....	February	70.0%
March	.....	March	70.5%
April	.....	April	70.0%
May	.....	May	69.4%
June	.....	June	72.3%
July	.....	July (b)	67.8%
August	.....	August	70.9%
September (c)	59.4%	September (c)	75.0%
October	64.7%	October	75.6%
November	61.7%	November	.....
December (a)	62.1%	December	.....

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS, 1935		CORRESPONDING WEEKS, 1934	
*November 9	75.6%	November 10	62.1%
*November 16	74.7%	November 17	61.6%
*November 23	76.7%	November 24	61.8%
*November 30	71.5%	December 1	61.4%

The following statistics show the number of mills reporting by ratio groups:

Ratio Limits	Number of Mills Reporting, Current Weeks: Nov. 9, 1935	Nov. 16, 1935	Nov. 23, 1935	Nov. 30, 1935
0% to 50%	92	91	85	94
51% to 100%	247	243	247	148
Total Mills Reporting	339	334	332	242

* Subject to revision until all reports are received.
These data exclude (a)—Christmas Day, (b)—Fourth of July, (c)—Labor Day.

PAPERBOARD OPERATING RATIOS

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours", were as follows:

1934	1935	1935	1935
September .62%	January ..61%	May 61%	September .69%
October ...63%	February ..67%	June 65%	October ...76%
November .56%	March 67%	July 59%	
December .53% (a)	April 61%	August ...65%	

Week ending Nov. 9, 1935—75%
Week ending Nov. 16, 1935—69%
Week ending Nov. 23, 1935—72%
Week ending Nov. 30, 1935—63%

Latex in Industry

Latex in Industry by Royce J. Noble, Ph.D., has just been published by *The Rubber Age*, 250 West 57th street, New York. In the introduction it is stated that "A comprehensive write-up of latex technology—in other words, a review of all applications of latex known at present in the industry—has so far not existed. The constantly increasing interest for the direct application of latex, the difficulty in obtaining comprehensive and condensed information as to its processing, etc., has become a serious handicap to all interested in this comparatively new field of industrial activity.

"Dr. Noble's book fills this gap in our technical literature on latex and it fills it perfectly. Not only has it been written by a man who himself has had years of varied experience in this special field, but by a man who has also the ability of keeping his records as to progress and development up-to-date. The entire lay-out of the book will prove the first, the astounding completeness of the references added to each chapter the latter."

The application of latex in the paper industry is treated in an interesting manner in numerous pages throughout the book. The price of this volume is $7.00.

For Research, Teaching and Testing

So that users can readily select the instruments they need for measurements in laboratory, plant or field, the entire L & N line for research, teaching and testing has now been listed, briefly described and priced in a compact broadside which serves as an exceptionally useful catalog.

A copy may be had by asking Leeds & Northrup Company, 4934 Stenton avenue, Philadelphia, Pa., for "Broadside E."

here's how

WE INSURE THE QUALITY OF

SULPHATE of ALUMINA

We begin at the beginning... use only the finest of raw materials... Bauxite from deposits under our own control in Georgia, Arkansas and South America... Sulphuric Acid of the highest quality. Every ingredient is checked to meet the most exacting standards... and every step in manufacture is governed by the most rigid technical supervision.

This is your assurance of uniformity in strength and chemical composition plus low iron content—when you order Sulphate of Alumina from American Cyanamid.

American Cyanamid & Chemical Corporation

30 ROCKEFELLER PLAZA • NEW YORK, N. Y.

Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

The Application of Nitrocellulose Emulsions to Paper*

C. B. Hollabaugh[1]

The paper industry has in the past few years begun to realize that it is necessary to coat papers with film-forming materials to produce sheets highly repellant to moisture, oils and greases. This necessity arises from the porous and fibrous nature of paper and the inherently hygroscopic nature of cellulose. To secure suitable coating materials the paper industry has very naturally turned to the protective coating field.

Of the materials available in the protective coating industry, nitrocellulose lacquer has perhaps found the greatest use for coating paper. Nitrocellulose lacquer has been used because it is one of the few coating or film-forming materials that can be made sufficiently flexible to bend with the paper and at the same time present a hard, non-tacky, glossy surface. Most coating materials, if softened sufficiently for flexibility, are tacky or sticky. Furthermore, most coating materials, particularly those which dry by oxidation or polymerization, become increasingly hard and brittle on aging; whereas, lacquer does not materially change once it is thoroughly dry. The flexibility of nitrocellulose lacquer is changed less by variations in humidity than any other coating. This is an important advantage in coating a highly flexible material such as paper.

For those entirely unfamiliar with lacquer technology, it may be pointed out that a nitrocellulose lacquer is a solution of nitrocellulose with one or more film modifying ingredients in a suitable solvent mixture. The term nitrocellulose is synonymous with pyroxylin or "soluble cotton." Nitrocellulose is very similar in appearance to ordinary cotton, and in the manufacture of lacquer is dissolved to form a colloidal solution, which, when applied in a film, dries to a continuous, transparent coating, unless pigment has been added to make the coating opaque.

The film-modifying ingredients may include (1) *plasticizers* for making the film more flexible and softer; (2) *resins* for making the film harder and of higher gloss; or (3) *pigments* for imparting color to the film. A wide variety of other types of materials come under the heading of film-modifying ingredients, but those already mentioned are the most important ones.

The solvent mixture is usually a mixture of one or more nitrocellulose solvents, such as esters or ketones, and a hydrocarbon diluent such as toluol. The hydrocarbon diluent is added to reduce the cost of the solvent and acts also as a solvent for the resin usually present. Alcohols, i. e., butyl or amyl alcohol, are added frequently to improve the solvent power of the mixture and improve the solution secured.

Expensive decorative and fancy box papers have been lacquered for years. Such papers require the finest possible coating and nothing has been found superior to a nitrocellulose coating. This accounts for the extensive use of nitrocellulose lacquer for this purpose in spite of its higher price. These coated papers are perhaps better known as pyroxylin-coated papers.

In addition to the desirable properties of nitrocellulose coatings previously mentioned, they have excellent grease- and water-proofing properties when applied to paper. However, to develop these properties at a reasonable cost it has been necessary to start with a relatively expensive sheet, such as glassin, which is substantially non-porous. Nitrocellulose lacquers are now being successfully applied to paper of this sort.

The application of lacquer solutions directly to the relatively porous surfaces of less expensive papers and boards has not been wide-spread because of the relatively high cost of the large amount of lacquer required. However, there is no reason why satisfactory processes for lacquering such papers and boards cannot be developed and permit the commercial use of inexpensive lacquered paper.

Definite progress has, in fact, been made in this direction by pretreating the sheet with a surface size to eliminate undue absorption by the porous sheet. Materials such as starch, gelatine or casein, plasticized with glycerine, are suitable for this treatment. Papers and boards treated in this way and then lacquered are water and greaseproof, and are well suited for numerous uses. Carton board is now being lacquered in considerable quantities by utilizing properly prepared board. Lacquered labels are likewise in quantity production.

* Presented at the meeting of the Delaware Valley Section of the Technical Association of the Pulp and Paper Industry, Engineers Club, Philadelphia, Pa., May 24, 1935.

[1] Hercules Powder Company, Wilmington, Del.

New Practical Method

Attractive products can be produced in this way, but their field of application is still limited by their cost. To widen their field of application it is obviously desirable to reduce this cost. This can be done by reducing the cost of the surface-sizing treatment, the cost of the lacquers, or both. Considerable study has been devoted to these problems with the result that what appears to be a satisfactory solution has been developed, in the form of a radically new method of applying nitrocellulose to porous sheets. This process has been developed in the laboratory and is now in the process of commercial introduction. It is being offered to the paper industry as a challenge for its commercial development, since its commercial application must finally come from the paper technologist.

Briefly, this method consists of applying nitrocellulose directly to the porous sheet, in the form of an aqueous emulsion, in which a viscous nitrocellulose lacquer is the disperse phase, to produce a thin, continuous, non-porous film over the surface of the sheet. In this method none of the nitrocellulose is wasted by penetrating the sheet, and no preliminary surface-sizing treatment is necessary.

The economy of this method is obvious when it is realized that it entirely eliminates the cost of the preliminary surface-sizing treatment, and, in addition, makes possible a reduction in the cost of the lacquer itself by eliminating a part of the solvent necessary when applied by the ordinary methods. As solvents of any kind cost more than water, the saving is apparent.

This method was developed in two stages. First, useful protective coating emulsions were developed, and then experimental work on the application of these emulsions to paper products led to the discovery of the very surprising fact that they could, by proper formulation, be applied to very porous surfaces *without substantial penetration.*

Those who are familiar with the lacquer industry know that the presence of water in nitrocellulose lacquers has always been regarded as highly undesirable. This has been with good reason. The presence of water in the usual lacquer causes the film to "blush" on drying. This so-called "blushing" is due to an actual precipitation of nitrocellulose during the evaporation of the solvent mixture and shows up as a whitening of the film, with a decrease in strength and flexibility. For this reason, manufacturers of lacquer nitrocellulose go to considerable expense to dehydrate their finished nitrocellulose with alcohol to remove the water.

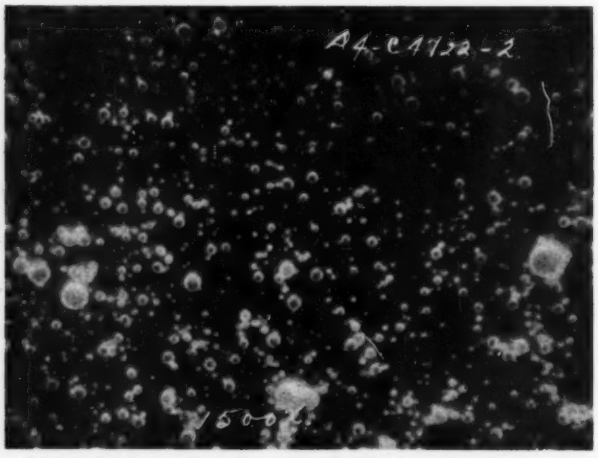


FIG. 1
A photomicrograph of a nitrocellulose lacquer emulsion made with an homogenizer type colloid mill, at a magnification of 1500.

In the face of this, surprising as it may seem, it has been possible to make emulsions of nitrocellulose lacquer in which the nitrocellulose lacquer is dispersed as minute droplets and actually suspended in water. These emulsions can be so formulated that they will dry to clear films on any surface, and under any conditions of atmospheric humidity. Fig. 1 is a reproduction of a photomicrograph of such an emulsion, taken at a magnification of 1500. The spheres are minute droplets of lacquer, approximately one micron or one thousandth of a millimeter in diameter. The background is the continuous water phase.

Water Emulsion

Although emulsification adds to the cost of the nitrocellulose solution, this is more than offset by the reduction in the cost of solvent used, and in the increased thickness of film which can be applied in one coat. Naturally, there is no cheaper suspending medium than water.

To explain more completely the reason for emulsification, we must first consider an inherent property of nitrocellulose. It has the property of giving viscous solutions at comparatively low concentrations. The viscosity of a solution of nitrocellulose at any given concentration depends upon the viscosity type of the nitrocellulose employed. The lower the viscosity type, the more fluid will be the solution produced. However, there is a limit below which the viscosity type cannot be reduced without a marked loss in the strength and flexibility of the film produced. There is, then, a definite limitation on the concentration of nitrocellulose which can be put into a solution to be used for a given method of application. Thus, not more than 10 to 12 per cent of ½ sec. nitrocellulose in a good solvent mixture can be satisfactorily applied with a spray gun, and about 16 per cent is the maximum that can be applied with a roller coating machine.

The viscosity of an emulsion depends upon the viscosity of the continuous or external phase, upon the ratio of the amount of dispersed phase or internal phase to the amount of continuous or external phase, and upon the droplet size of the internal phase. The viscosity of the internal phase has no bearing whatever on the viscosity of the final emulsion, because the droplets of the emulsion roll around easily, like fat globules in milk.

A consideration of these factors indicates that a dispersion of a solution of nitrocellulose as the internal phase of an aqueous emulsion will give a viscosity approaching that of water, regardless of the viscosity of the nitrocellulose solution. Such an emulsion will, then, not have the limitation on the concentration of nitrocellulose which an ordinary lacquer has. This means that with a solution no more viscous than water, a heavy deposit of nitrocellulose lacquer can be applied with one coat.

This naturally leads to the question: How concentrated a solution of nitrocellulose can be used in the form of an emulsion?

The answer here depends on the viscosity type of nitrocellulose used, and is the concentration which will give a viscosity such that the dispersed droplets can coalesce into a continuous film, and flow out smooth as the emulsion dries. For any given viscosity type nitrocellulose this is *well above* the concentration which can be used in a lacquer solution to be applied by any of the usual methods, which, as previously pointed out, results in the deposition of a thicker film, with one application.

Use of Colloid Mill

The production of a nitrocellulose emulsion has proved to be a relatively simple process, once the correct formulation has been developed. The lacquer and water solutions are prepared and mixed by stirring them together. This mixture, which is a very coarse emulsion, is then emulsi-

fied by passing it through a colloid mill. The colloid mill may be one which emulsifies by the shearing action of rapidly moving surfaces, such as the Premier colloid mill, or it may be one of the homogenizer type which emulsifies by forcing the mixture through a fine orifice. An example of such a mill is the Manton-Gaulin Homogenizer. These particular mills are mentioned merely by way of example. There are many others on the market which are also suitable.

A mill of the homogenizer type is preferable to one of the shearing type. Fig. 2 is a reproduction of a photomicrograph of an emulsion made with a moving-surface-type mill, at a magnification of 1500. The droplets here are approximately 8 microns as compared with approximately 1 micron for the emulsion made with the homogenizer type mill shown in Fig. 1. An emulsion having an average droplet size of 1 micron is decidedly more stable than one having an average droplet size of 8 microns. Since stability is an important factor with any emulsion, it is of course desirable to use the mill which gives the smallest particle size, namely the homogenizer type mill.

The problem in the production of a useful nitrocellulose emulsion has been to secure the proper formulation. Table 1 shows the formula of an emulsion adapted for coating

TABLE I
PAPER COATING EMULSION

LACQUER PHASE		WATER PHASE	
38.5 Parts	½ Sec. Nitrocellulose	33 Parts	Water
23 Parts	Triethyl Citrate	0.33 Parts	Sodium Lauryl Sulphate
11 Parts	Butyl Acetate		
16.5 Parts	Ethyl Alcohol	33.33	
11 Parts	Tuluol		
100.0			

Viscosity of lacquer phase—1800 sec. steel ball (378,600 centipoises)
Viscosity of emulsion—45 centipoises

paper. It will be noted, first of all, that the water solution of sodium lauryl sulphate makes up only about one-fourth of the total weight, and yet forms the continuous phase of the emulsion. It will be noted further that the lacquer phase is very similar in composition to an ordinary lacquer solution, but contains a much higher percentage of nitrocellulose than can be used in an ordinary lacquer. The triethyl citrate used in the lacquer phase is a non-volatile solvent for nitrocellulose, which acts as a plasticizer, making the film highly flexible. The solvent mixture of butyl acetate, ethyl alcohol and toluol, although containing water miscible ethyl alcohol, is, as a whole, sufficiently water-immiscible to keep the nitrocellulose in solution. It will be observed that the lacquer phase contains 38.5 per cent nitrocellulose, and has a viscosity of 1800 Sec., which is 678,600 centipoises; while the finished emulsion has a viscosity of only 45 centipoises. A viscosity of 678,600 centipoises is, of course, far above the useful range of application. A lacquer for roller coating can ordinarily not have a viscosity above 800 centipoises.

By the use of this emulsion, about two or three times as much nitrocellulose can be applied for a given solvent cost, as is possible with a nitrocellulose lacquer. This means quite a substantial saving in the volatile solvent, which is ordinarily the most expensive part of a lacquer.

This saving in solvent is not the only advantage made possible by the use of an emulsion. The emulsion itself is much easier to handle than the usual protective coating solutions. The fire hazard is greatly reduced by emulsification. A nitrocellulose emulsion will not burn in the flame of a Bunsen burner until it has become hot enough to boil off solvent vapor. This vapor then burns over the top, without the emulsion itself burning. The extent of the fire hazard depends upon the boiling point of the solvent mixture used. One sample of emulsion we prepared and sent to the Interstate Commerce Commission was given a rating such that no red label was required

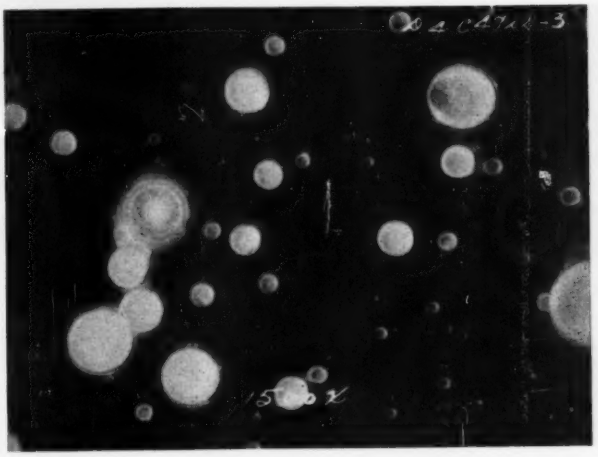


FIG. 2
A photomicrograph of a nitrocellulose lacquer emulsion made with a moving surface type colloid mill, at a magnification of 1500.

for shipment. However, with another, using a much lower boiling solvent, a red label was required.

Fire Hazard Reduced

We believe that the use of a nitrocellulose emulsion in a paper coating operation will be accompanied by far less fire hazard than the use of the usual protective coating solution. In the coating operation, the aqueous solution of emulsifier will act as a conductor of electricity, materially reducing the hazard from static. In the dryer, the solvent vapor will be much diluted with water vapor, materially reducing, if not eliminating, the danger of fire and explosion of the combustible vapor.

The particular formulation shown in Table 1 is merely an example of the wide variety of formulations which can be made. Thus, for example, instead of triethyl citrate, any of the usual lacquer plasticizers or softeners may be used. The percentage used will, of course, depend upon the properties desired of the final film. Other materials, such as resins, waxes, pigments, etc., may be added to modify further the properties of the final film.

Table 2 shows the ranges of formulation which can be used to produce satisfactory emulsions. With each of

TABLE II
USEFUL RANGES OF FORMULATION VARIABLES IN PAPER COATING EMULSIONS

Concentration of nitrocellulose in lacquer phase	10%-50% (by weight)
Viscosity type of nitrocellulose	0.125-400 sec. (Hercules)
Viscosity of lacquer phase	3-27,000 sec. (falling ball)
Boiling range of solvent mixture	80-140 deg. C.
Ratio of lacquer phase to water phase	1.75:1 to 4:1 (by weight)
Percentage of emulsifying agent in water phase	¼%-5% (by weight)

these variables, the particular figure chosen will depend entirely on the use to be made of the emulsion. Nor are they all independent variables. The viscosity of the lacquer phase will be determined by the viscosity type nitrocellulose and the percentage used. The solvent mixture may vary in average boiling point between 80 deg. and 140 deg. C., but it must be substantially water-immiscible to retain the nitrocellulose in solution. The exact solvent combination will, of course, depend on the use to be made of the emulsion. The ratio of lacquer phase to water phase also has a rather wide range of variation. The particular figures chosen here, will depend on the stability requirements, the emulsion viscosity desired, and the conditions under which it is to be dried. The percentage of emulsifying agent used, within the range shown, will depend on the particular one chosen, the stability requirements for the emulsion, the surface to which the emulsion is to be applied, and the properties desired of the final film.

The stability of the nitrocellulose emulsion secured will depend on the formulation chosen within the ranges shown in Table 2. By judicial selection of the formula and correct emulsification, nitrocellulose emulsions can be produced with regularity, which show no evidence of instability after storage for six months or more in terne-plated or glass containers. So far we have been unable to produce nitrocellulose emulsions which are permanently stable, but active research is being done on this problem. While this tendency of nitrocellulose emulsions to instability after long storage may be somewhat of a handicap to their development in certain fields, there appears to be no reason why it should cause difficulty in paper coating.

Table 3 shows the more common lacquer solvents and diluents which can be used in the formulation of the lacquer phase, with their boiling points. The solvent mixture formulated from these materials must be sufficiently

TABLE III
SOLVENTS AND DILUENTS SUITABLE FOR USE IN PAPER COATING EMULSIONS

Name	B. P.	Name	B. P.
Ether	35 deg. C.	Toluol	110 deg. C.
Acetone	56	Butyl Acetate	113
Mineral Spirits	50+	Amyl Alcohol	115
Methyl Acetate	60	Methyl Isobutyl Ketone	118
Methanol	63	Methyl Cellosolve	120
Ethyl Acetate	75	Pentasol	126
Carbon Tetrachloride	76	Isoamyl Alcohol	130
Ethanol	78	Isobutyl Carbinol	130
Benzol	80	Cellosolve	130
Ethyl Methyl Ketone	80	Ethyl Benzene	135
Isopropyl Alcohol	80	Butyl Ethyl Carbonate	135
Ethyl Propionate	98	Pent-Acetate	135
Diethyl Carbonate	100	Xylol	139
Diethylene Oxide	101	Butyl Propionate	139
Butanol	102		

water-immiscible to keep the nitrocellulose in solution, and the boiling points of the various components must be so selected that the solvent mixture remains water-immiscible during its evaporation. This does not mean that no water-miscible components can be used. In fact, you will note that a number are listed, e. g., acetone and ethyl acetate. It does mean, however, that they can be used only in limited quantities admixed with highly water-immiscible solvents or diluents.

In addition to this requirement for water-immiscibility, the old lacquer problem of "solvent-balance" remains. In emulsions, however, the solvent mixture must not only be formulated so that it is a solvent for all the non-volatile ingredients of the film throughout its evaporation, but it must be adjusted also to evaporate slowly enough so that the water is removed from the emulsion by evaporation or by absorption before the lacquer droplets become too viscous to coalesce into a film. Obviously, this is tied up with the surface to which the emulsion is to be applied and with the humidity conditions under which the emulsion is to be dried. Because of the high absorbency of porous paper surfaces for the water phase of the emulsion, lower boiling and cheaper solvents and diluents can be used in paper coating emulsions than in protective coating emulsions to be applied to a non-porous surface. This gives an attractive advantage in cost.

Table 4 shows a list of emulsifying agents which may be used alone or in mixtures in nitrocellulose emulsions. The particular one chosen will depend on the stability required of the emulsion, and the surface to which the emulsion is to be applied. The selection here is governed by the facts that the emulsifier must be compatible in the quantity which gets into the final film, and it must not render it unduly sensitive to water.

The tolerance allowable for water-sensitiveness will depend on the ultimate use of the film. Stable emulsions have been produced which, when dried on a non-porous surface so that all the emulsifying agent used goes into the final film, have given protective coating films as resistant to weathering as lacquer films of the same formulation, but not containing the emulsifying agent. Only the most delicate tests will show more water-spotting from such an emulsion film than from the lacquer film. Obviously, more emulsifying agent can be tolerated in an emulsion for coating a porous surface than for coating a non-porous surface, since the porous surface absorbs at least a part of the water phase and its dissolved emulsifying agent, so that all the emulsifying agent does not go into the final film.

TABLE IV
USEFUL EMULSIFYING AGENTS

Sodium abietate	Sodium lauryl sulphate
Sodium oleate	Sodium butyl naphthalene sulphonate
Ammonium oleate	Sodium isopropyl naphthalene sulphonate
Ammonium linoleate	Oleyl glyceryl sulphate
Sulphonated castor oil	Sodium dodecyl mercapto acetic acid
Sodium oleyl sulphate	Gelatine
Sodium myristyl sulphate	Methyl cellulose
Sodium stearyl sulphate	Sulphonated diphenyl

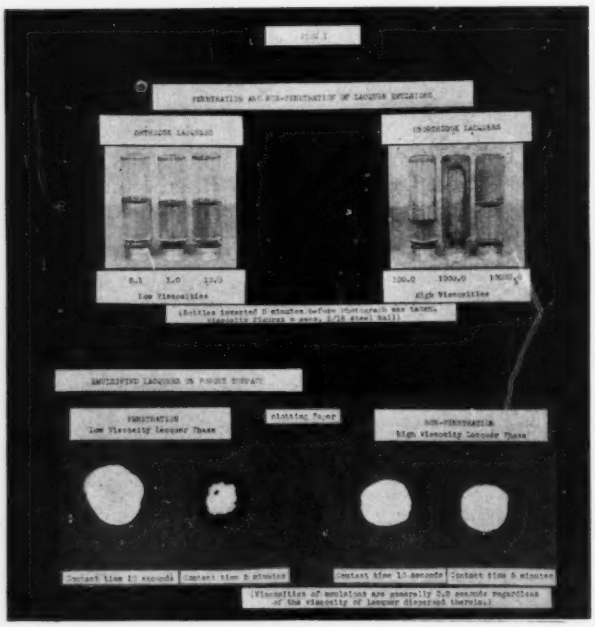


FIG. 3

Thin Non-Porous Films

The next point which will be discussed is how the surface sizing treatment can be entirely eliminated and make possible *thin,* continuous, non-porous films on porous papers.

Penetration of the pores of paper by a nitrocellulose emulsion has been discovered to be a function of the viscosity of the lacquer solution which is dispersed in the form of droplets. As solutions of increasingly higher viscosity are used as the disperse phases in emulsions, the penetration drops off very rapidly. This means that there is a certain limit above which the penetration is very slight, resulting in continuous, non-porous coatings of comparatively light weight. This can best be explained by reference to Figs. 3, 4, and 5.

The lower half of Fig. 3 illustrates the difference in the behavior of drops of emulsions having low and high viscosity lacquer phases, respectively, when placed on the very porous surface of a sheet of blotting paper. It will be observed that the emulsion of the low viscosity lacquer solution began to show penetration after 10 seconds on the surface, as shown by the thin black band around the white drop of emulsion, and after five minutes had shown quite substantial penetration as indicated by the wide black band around the drop and by the decreased size of the

drop. Now, compare this with the absence of any evidence of penetration shown by the drops of the emulsion of a high viscosity lacquer solution. It will be noted that there is no evidence of penetration by this emulsion even after five minutes.

The upper half of Fig. 3 will give the reader a definite idea as to what is meant by the terms high and low viscosity lacquer solution. The photograph illustrated there was taken just five minutes after the vials were inverted. It will be observed that the highest viscosity lacquer solution, having a viscosity of approximately 10,000 seconds as determined by the falling ball method, has shown no evidence of flowing down the vial in five minutes. The lacquer having a viscosity of 1000 seconds has only partly flowed down, while the one having a viscosity of 100 seconds has not entirely flowed down. None of these lacquers could be applied by the usual methods of application, yet they can be emulsified without difficulty and then applied by any of the usual methods.

Fig. 4 shows a photomicrograph of the cross-section of a sheet of blotting paper which has been coated with an emulsion in which the lacquer solution has a viscosity of 116,000 centipoises. The lacquer contained a dye and shows up as the black band. It will be noted that there has been substantially no penetration into the body of the blotting paper. Now compare this with Fig. 5 which shows a blotting paper coated with an emulsion of a lacquer solution having a viscosity of 1,100 centipoises, which is a higher viscosity than could be applied ordinarily without emulsification. It will be noted in this figure that there is almost no film on the surface of the paper, but that it has penetrated deep into the body of the paper as shown by the dark spots.

It is perfectly obvious that the paper shown in Fig. 4 should be water- and oil-proof, since the surface film is water- and oil-proof. Such was found to be the case by actual test. On the other hand, it is equally obvious that the paper shown in Fig. 5 should not be water- and grease-proof since there is no continuous film of nitrocellulose over all the cellulose fibers. This, likewise was found to be the case by actual test.

The surprising part of this is that the droplet size of the emulsion has no bearing on the penetration. Thus, a large droplet size emulsion of low lacquer phase viscosity will penetrate a porous sheet quite readily, while an emulsion of a high viscosity lacquer of very fine droplet size will penetrate only very slightly.

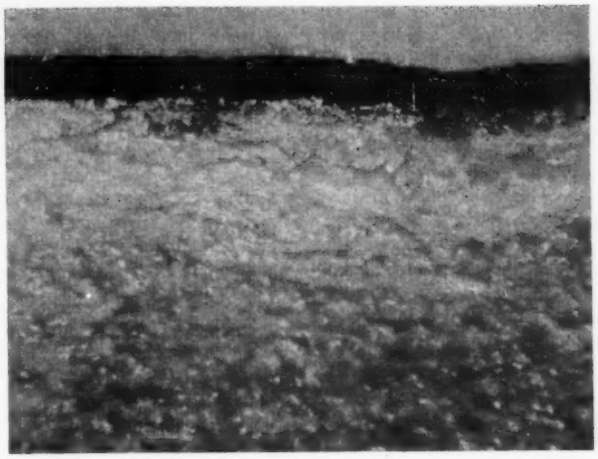


FIG. 6
A photomicrograph of the cross section of a sheet of blotting paper coated with a high viscosity lacquer solution, taken at a magnification of 100.

Penetration of Emulsions

It is interesting to compare the penetration of the unemulsified lacquer solutions with that of the emulsions. Figs. 6 and 7 show the penetration of the lacquers used in the emulsions coated on the blotting papers shown in Figs. 4 and 5. In these figures it will be noted that the penetration of the lacquer solutions compare in exactly the same way before emulsification, as they did after emulsification, as shown in Figs. 4 and 5. Thus, it appears that the viscosity of the lacquer phase, rather than droplet size, determines penetration.

Fig. 8 shows a photograph of a series of papers of different porosities, coated in sections with emulsions having different lacquer phase viscosities. After these coatings were dry a drop of V. M. & P. Naphtha was placed on each section. Where the film is porous the naphtha runs through and soaks into the paper, making a dark spot. It will be noted that as the papers become more porous, coatings from emulsions having higher and higher lacquer phase viscosities are required to give a non-porous film.

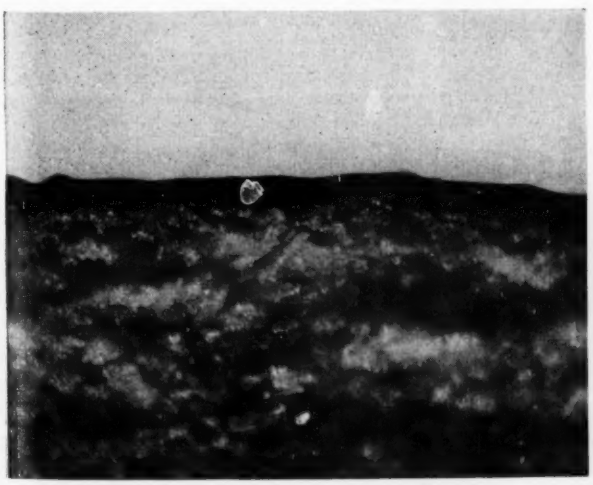


FIG. 4
A photomicrograph of the cross section of a sheet of blotting paper coated with an emulsion of a high viscosity lacquer solution taken at a magnification of 100.

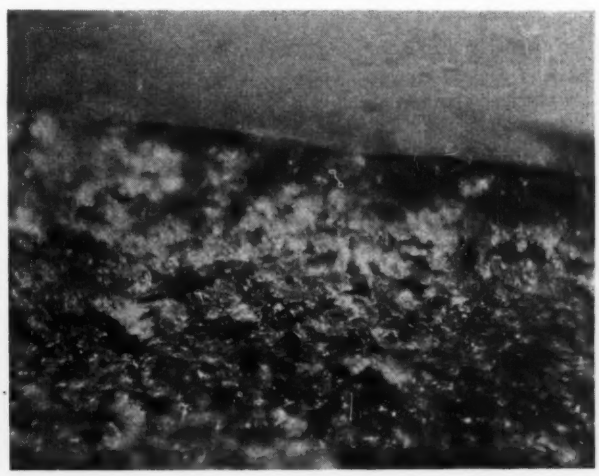


FIG. 5
A photomicrograph of the cross section of a sheet of blotting paper coated with an emulsion of a low viscosity lacquer solution taken at a magnification of 100.

The decrease in the penetration of a paper of a given porosity drops off so rapidly with the increase in viscosity that it is possible to set a minimum figure for the viscosity which will give a substantially non-penetrating coating on a paper of any porosity. Examples of such figures are given in Table 5.

Table 5 lists a series of papers and boards of different porosities as measured by the Bureau of Standards "Air Permeability Test" *(1)*. As a matter of fact, the figures given in the column entitled "Porosity of Base Material" were measured at the Bureau of Standards. The "Porosity Factor" is the porosity multiplied by the thickness

TABLE V

RESULTS OF COATING PAPER OF DIFFERENT POROSITIES WITH NITROCELLULOSE LACQUER EMULSIONS

Base Material Coated	Porosity at base material [1]	Thickness of base	"Porosity factor" of base [2]	Min. vis. of lacquer phase [3]
PAPERS				
Fernside Ledger.....	3.7	0.005 In.	18.5	10 Sec.
Plain Bond	40.9	.004	163.6	20 Sec.
Champion Garmond Text.	257.0	.005	1285.0	250 Sec.
CARDBOARD				
Lion Jute Tag.....	27.0	.014	378.0	150 Sec.
Jute	96.6	.042	4057.2	1,000 Sec.
Blotting	2238.0	.021	46998.0	10,000 Sec.

[1] Porosity measured by Bureau of Standards "Air Permeability Test" and expressed as cc. of standard air flowing through a sq. m. of paper in one sec. under a pressure differential of one gm. per sq. cm.
[2] Porosity factor = Porosity × thickness in inches × 1000.
[3] Viscosity of lacquer phase expressed in sec. falling ball (A.S.T.M.).

of the sheet, expressed in thousandths of an inch, and corrected for the differences in thickness between the different samples. The columns entitled "Minimum Viscosity of the Lacquer Phase" gives the lowest viscosity lacquer phase which can be used and still obtain a minimum penetration of the porous surface. It likewise is the lowest viscosity which will permit the thinnest possible continuous non-porous film over the surface. These figures were determined by a series of tests similar to that shown in Fig. 8.

It will be noticed that there is a decided increase in the minimum viscosity which can be used as the porosity of the paper increases from one sample of paper to the next. Fig. 9 shows curves of the relationship between these two factors, on two different scales. The scale of the upper curves is ten times that of the lower curve, on both axes. It will be noted that, within the limits of experimental error, the points fall on a straight line. With the aid of these curves, it is possible to determine the minimum viscosity of the lacquer phase which can be used to secure the lightest possible continuous, non-porous coating on any

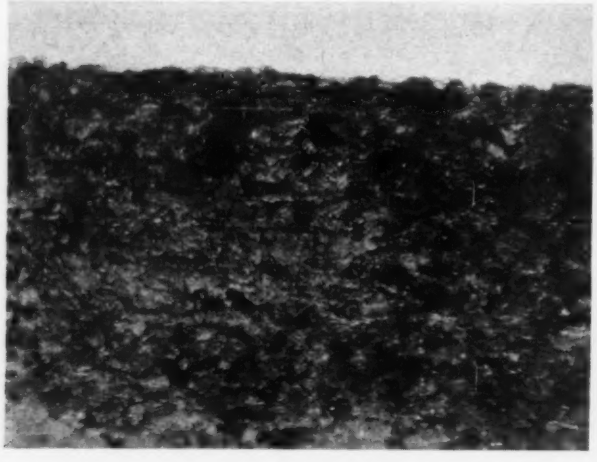


FIG. 7
A photomicrograph of the cross section of a sheet of blotting paper coated with a low viscosity lacquer solution, taken at a magnification of 100.

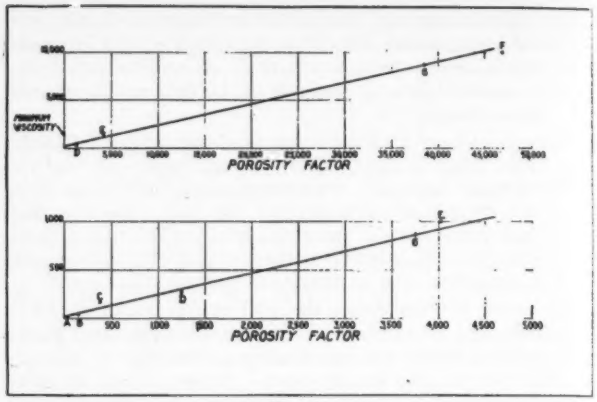


FIG. 9
Viscosity vs. porosity on two different scales.

sample on which the porosity factor is known, or can be estimated with any degree of accuracy.

A question must arise in the mind of the reader as to how the lacquer phase viscosity can be varied over the wide range necessary for papers of different porosities. This can be done by varying the concentration of nitrocellulose present in the lacquer phase, by varying the viscosity type of nitrocellulose used, or by a combination of both. Table 6 shows the enormous range of viscosity which can be obtained merely by varying the viscosity type of the nitrocellulose.

Table 6 shows a formula for a paper-coating emulsion containing a relatively low percentage of nitrocellulose. It is 10 per cent of the lacquer phase, as compared with 35.8 per cent in the emulsion formula shown in Table 1. With this comparatively low percentage of nitrocellulose.

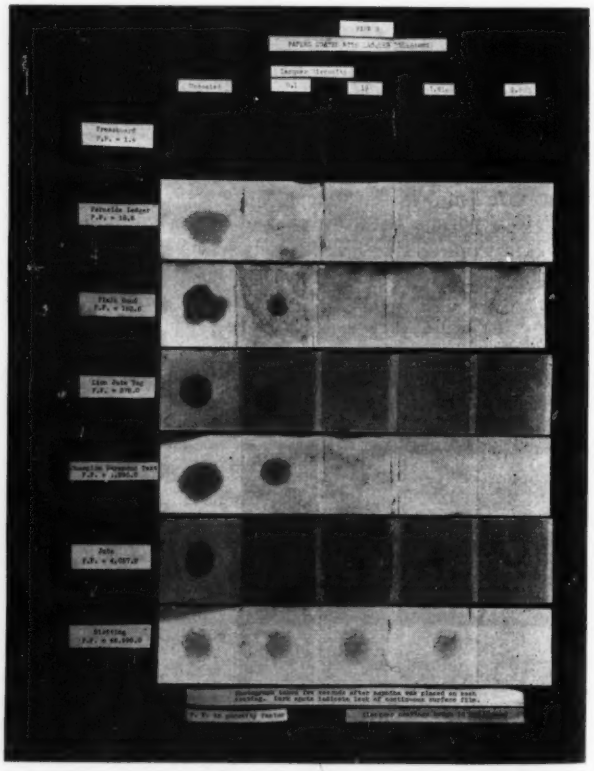


FIG. 8

TABLE VI
FORMULA FOR TYPICAL PAPER COATING EMULSION

LACQUER PHASE		WATER PHASE	
10	Parts nitrocellulose	33	Parts water
15	Parts castor oil	0.66	Parts sodium resinate
4	Parts ethyl alcohol		
36	Parts butyl acetate	33.66	
35	Parts toluol		
100			

VISCOSITY OF ABOVE LACQUER PHASE EXPRESSED IN SECONDS FALLING BALL USING DIFFERENT VISCOSITY TYPES OF NITROCELLULOSE

½	sec.	(Hercules)	nitrocellulose—solution visc.	2 sec.
5	sec.	(Hercules)	nitrocellulose—solution visc.	20 sec.
18	sec.	(Hercules)	nitrocellulose—solution visc.	100 sec.
110	sec.	(Hercules)	nitrocellulose—solution visc.	250 sec.
200	sec.	(Hercules)	nitrocellulose—solution visc.	1,000 sec.
400	sec.	(Hercules)	nitrocellulose—solution visc.	10,000 sec.

it is possible to get the wide range of solution viscosity by varying the types of nitrocellulose indicated in the lower half of this Table. Thus, ½ second type nitrocellulose will give a viscosity of 2 seconds, as measured by the falling ball method, in the lacquer phase formula shown, and from there we can go by graded steps to the high viscosity of 10,000 seconds, falling ball, by using a 400 second type nitrocellulose. Now, if a variation in the concentration of nitrocellulose is superimposed upon this, it can readily be appreciated that any desired viscosity may be obtained. The only limitation is the difficulty encountered in emulsifying the higher viscosities. However, this is not serious. In the laboratory it has been possible to emulsify solutions of as high as 27,000 sec. viscosity to produce emulsions which could be used without difficulty.

Lacquer emulsions have been applied to paper both by spraying and roller coating, and there should be no difficulty in coating them with a knife coating machine. These different methods of coating immediately suggest a question as to whether the viscosity of the final emulsion can be varied. The answer is that it can. This can be done by decreasing the water content, either by using a larger ratio of lacquer phase to water phase originally, or by adding a water immiscible liquid and emulsifying it as a second disperse phase. The viscosity can also be increased by the addition of gelatine, methyl cellulose, or other hydrophyllic colloids to the water phase. However, this must be done with consideration for the porosity of the surface to which the emulsion is to be applied.

Table 7 gives an idea as to what can be done to the viscosity of the emulsion by the addition of a water-immiscible

TABLE VII
AN EXAMPLE OF THE ADJUSTMENT OF EMULSION VISCOSITY BY ADDITION OF A VOLATILE LIQUID

Sample of Emulsion	Water Content	Viscosity
Original emulsion	29% by weight	50 centipoises
Original emulsion plus toluol.....	26.8% by weight	70 centipoises
Original emulsion plus toluol.....	25.4% by weight	90 centipoises
Original emulsion plus toluol.....	23.4% by weight	165 centipoises
Original emulsion plus toluol.....	21.5% by weight	540 centipoises

solvent. This table shows the effect of successive additions of toluol to an emulsion containing 29 per cent water and having a viscosity of 50 centipoises. It will be noted that the addition of sufficient toluol to reduce the water content to 21.5 per cent increases the viscosity to 540 centipoises. As a matter of fact, these emulsions have been prepared with a consistency about that of mayonnaise.

Perhaps all this detailed explanation of nitrocellulose emulsions has been rather difficult to follow, so it might be well to sum up the essential facts. Let us do this by reviewing very briefly the fundamental points of formulation, the properties, and then the applications.

We have tried to indicate that the basic principles of emulsifying nitrocellulose and applying it to paper are simple, and that the actual operation is not difficult or expensive once the proper formulation and procedure for a given set of conditions has been worked out. On the other hand, the reader cannot help but realize that with the wide variations possible even someone familiar with lacquer ingredients and having skill in handling them, must necessarily do considerable experimenting to ascertain the correct emulsion for a particular use.

Limitations

We believe, however, that the limitations pointed out in this article will serve to reduce the amount of experimenting necessary to secure the correct formulation for a given use. There are four limitations we have discussed which may be briefly restated as follows:

1. The solvent mixture used in the lacquer phase must be sufficiently water-immiscible to keep the nitrocellulose in solution in the emulsion, and it must remain so as it evaporates during the drying of the film.

2. The boiling range of the solvent mixture must be high enough to allow the water to be removed from the film by evaporation, or absorption by the surface being coated, before sufficient solvent evaporates to prevent the droplets of lacquer from coalescing and flowing into a smooth film.

3. The amount of the water solution of emulsifying agent must be kept low to avoid the necessity of using expensive high boiling solvents in the lacquer phase, and to allow adjustment in the viscosity of the final emulsion.

4. The emulsifying agent, and the concentration used must be selected to avoid making the final film water sensitive or hazy.

Summary

It has been shown that nitrocellulose emulsions are quite versatile, in that practically all the usual lacquer ingredients can be used, making it possible to "tailor-make" a coating to fit any particular set of specifications; that the viscosity or body of the emulsion and the drying time can be regulated so that the emulsion can be applied on a variety of types of coating equipment; and that the solids content can be changed so as to produce any desired thickness of coating.

It has further been shown that as compared to a conventional pyroxylin solution or lacquer, the emulsion uses much less solvent per pound of solids applied; that penetration of porous papers can be avoided without special treatment of the surface of the paper; and that very thin continuous (non-porous) coatings can be applied.

It was pointed out in the first part of this article that pyroxylin coatings are ideal for coating paper, and that their wide-spread use was limited chiefly by their cost and the fact that they could not be applied efficiently to porous papers. However, their use has been increasing considerably in spite of these limitations, and bids fair to continue increasing at an accelerated rate. In this article we have tried to present to the paper industry a new method of applying nitrocellulose coatings to paper, and have pointed out distinct advantages of this new method.

It is not claimed that this method is a panacea for all paper coating difficulties, or that it can displace ordinary lacquer solutions in paper coatings. Nor is it claimed that this method does not bring difficulties of its own. It is, however, presented to the paper technologists as a new tool which offers possibilities for the development of new and cheaper products, for which there is a growing demand. It is logical to expect that a process which make nitrocellulose coatings available for use in much wider fields, will give paper technologists an opportunity to improve some of their now excellent products.

Literature Cited

[1] Carson, "A Sensitive Instrument for Measuring the Permeability of Paper and Other Sheet Materials," *Paper Trade J.* 99, No. 16:44-52 (Oct. 18, 1934).

Waste Liquors and Gases of the Paper Industry

A Survey of Recent Domestic and Foreign Patent Literature on the Utilization of Waste Liquor and Waste Gases of the Pulp Industry, 1931-1935

(Third Compilation.)

Clarence J. West, Chairman, Committee on Abstracts and Bibliography, TAPPI

(Continued from the issue of December 12, 1935)

United States Patents (continued)

1037. 1,985,504. Dec. 25, 1934. Alfred G. Kernin. Feeding black liquor to a smelting furnace.

Black liquor is fed into a smelting furnace by means of compressed air to which has been added the required amount of sodium sulphate to make up for soda losses.

1038. 1,986,815. Jan. 8, 1935. Torsten Hasselstrom. Refined "sulphate black liquor" tall oil.

A refined, non-distilled, liquid tall oil substantially free from solid constituents and from ligneous substances of sulphate black liquor, and containing substantial amounts of resin acids, suitable for use in making soaps, is obtained by prolonged and repeated settling of constituents of crude tall oil.

1039. 1,986,816. Jan. 8, 1935. Torsten Hasselstrom. Flotation process.

The use of tall oil from black liquors as a flotation agent.

1040. 1,986,817. Jan. 8, 1935. Torsten Hasselstrom. Flotation reagent.

1041. 1,987,214. Jan. 8, 1935. George A. Richter. Cyclic process of pulping raw cellulosic material.

In pulping wood by the kraft process practically all of the black liquor is re-used, fortifying it with solid caustic soda or with a 50% solution, until the total solids content has been raised to about 50%. From this point a small portion of the black liquor is sent directly to the incinerator for recovery, and the remainder is brought up to the requisite strength in caustic soda and to the required volume and re-used for cooking.

1042. 1,991,413. Feb. 19, 1935. Elis Olsson. Digesting fibrous material.

In digesting material with a solution such as sodium sulphate or sulphite and reclaiming and concentrating the treating liquor, steam is separated from the hot liquor and treated material when the digester is discharged, the liquor is collected from the washer, the collected liquor is continuously heated by heat derived from the separated steam and the heated liquor is concentrated by removing the more volatile portions.

1043. 1,992,949. March 5, 1935. Paul Hodges. Floating soap.

A suspension agent suitable for use in a flotation process such as in treating sulphide or oxide minerals comprises "floating soap" obtained as a floating scum from the black liquors in the manufacture of sulphate or soda cellulose.

1044-1047. 1,993,096-7-8-9. March 5, 1935. Paul Hodges. Paint-, varnish- and lacquer-remover and metal cleaner, rust inhibitor and degreasing composition.

"Floating soap" obtained from the black liquors in the manufacture of soda or sulphate cellulose pulp may be used with amylene dichlorides, alcohol, water, oleic acid, etc. *No. 1,993,097* relates to metal-cleaning and corrosion-inhibiting compounds containing "floating soap" together with an organic metal-cleaning solvent such as amylene dichlorides and water, etc. *No. 1,993,098* relates to degreasing compounds containing "floating soap," together with a chlorinated hydrocarbon such as trichloroethylene and an alcohol, etc. *No. 1,993,099* relates to a rust inhibitor containing "floating soap" in aqueous solution.

1048. 1,995,999. March 26, 1935. Erik Oman. Apparatus suitable for drying paper and for evaporating lyes from sulphate and sulphite cellulose production, etc.

Various structural and operative details.

1049. 1,997,773. April 16, 1935. Gustaf Haglund. Treating waste liquors from cellulose digestion.

Waste liquor such as that from the sulphite digestion process and which contains compounds of alkali metal and of sulphur is concentrated and incinerated to remove water and combustible organic matter and to form a molten product containing alkali metal compounds. The product of the incineration is cooled to offset solidification and is roasted at a temperature sufficiently high to cause rapid oxidation of alkali metal sulphide and decomposition of alkali metal thiosulphate but not sufficiently high as to cause substantial sintering. After this treatment, the product is treated with water for recovery of soluble values.

1050. 2,004,205. June 11, 1935. Alfred G. Kernin. Smelting furnace for regeneration of black liquor.

Various structural and operative details.

1051. 2,005,422. June 18, 1935. Clarence C. Hunicke and Charles L. Wagner. Concentrating waste sulphite liquors from the pulp industry.

Hot flue gases are passed into the waste liquor and bubbled through a column of the liquor, the bubbles are broken up to a predetermined size and the moisture laden gases are exhausted while the surfaces of the waste liquor column are sprayed to maintain its predetermined height and to abate any foam. Apparatus is described.

1052. 2,006,138. June 25, 1935. Karl Heinemann. Separating sulphurous acid from sulphite waste liquor.

Various details of an apparatus are described, comprising a cylindrical vessel, a plurality of superposed rings and plates mounted in the vessel, an inlet nozzle over the rings and plates, an outlet for sulphur-dioxide-containing gases, a liquor outlet and connected to a trap, a connection between the trap and the top of the vessel for pressure equalization and a disk valve in this connection for admitting air from the atmosphere to the vessel when the latter is under vacuum.

1053. 2,007,024. July 2, 1935. Geo. A. Richter. Pulping wood chips.

Spent cooking liquor such as that from the use of alkaline material as a pulping reagent is smelted to produce a smelt containing sodium sulphide and sodium carbonate, the smelt is dissolved in water and the carbonate is causticized. Wood chips are impregnated with the uncausticized smelt solution and the impregnated chips are pulped in the causticized solution.

Canadian Patents

1054. 304,644. Oct. 7, 1930. Guy C. Howard. Treatment of sulphite waste liquor.

Sulphite waste liquor is allowed to react with a caustic lime reagent in solid phase until a heavy crystalline precipitate is formed and the liquor is alkaline; the precipitate is separated and the residual liquor allowed to react with caustic lime reagent in solid phase until a flocculated lignin-containing precipitate has been formed, the latter being in quantity sufficient to cause a masking of the reaction surface of the reagent particles resulting in a material lag in the reaction; such precipitated matter is separated and caustic lime in solid phase is added to the residual liquor, whereby a further and practically complete precipitation of the lignin constituent of the liquor takes place; finally the precipitate is separated.

1055. 306,941. Dec. 23, 1930. Linn Bradley and Edward P. McKeefe. Pulp manufacture.

Raw cellulosic material is digested in an alkaline liquor containing sodium sulphite, the spent liquor is concentrated, the combustible content burned and the inorganic content heated to produce sodium sulphide and sodium carbonate. These are dissolved in water and the solution is treated with carbon dioxide to produce pure hydrogen sulphide and convert all the sodium sulphide to sodium carbonate. The hydrogen sulphide is recovered as sodium salt and the sodium carbonate solution is treated with sulphur dioxide to produce substantially pure carbon dioxide and sodium sulphite solution. The carbon dioxide obtained is used for the carbonation of another batch.

1056. 307,799. Jan. 20, 1931. Lauri I. L. Durchman. Alpha-cellulose.

Alpha-cellulose is produced by cooking wood chips with black and white sulphate liquor with the addition of sodium sulphite in the proportion of 0.8-1.0% based on the air-dry weight of the wood chips, boiling the resultant pulp under atmospheric pressure with a mixture containing sodium hydroxide and sodium chloride, bleaching, treating the bleached pulp at room temperature for 3-6 hours with a 5-12% solution of sodium hydroxide, recovering the sodium hydroxide, washing and treating with oxalic acid to neutralize the residual alkali and to facilitate extraction of other residual and coloring impurities.

1057. 312,334. June 16, 1931. George A. Richter. Liberation of fiber.

Raw cellulosic material is cooked in a solution of sodium carbonate to dissolve a portion of its cementitious content then cooked in a solution of sodium sulphide to liberate the fiber. The spent liquors are mixed, and the inorganic content is melted in a reducing atmosphere to produce sodium carbonate and sodium sulphide, and dissolved in water. Sodium carbonate is selectively crystallized for a subsequent first-mentioned cooking, and the sodium carbonate remaining in the solution is causticized and used for a subsequent second-mentioned cooking.

1058. 312,335. June 16, 1931. George A. Richter. Production of chemical wood pulp.

Raw cellulosic material is cooked in a solution of sodium hydroxide short of liberating the fiber, then cooked in a solution of sodium sulphide to complete fiber liberation. The spent liquors are mixed and the inorganic content melted in a reducing atmosphere to produce sodium carbonate and sodium sulphide. The melt is dissolved in water and the sodium carbonate selectively crystallized. The sodium carbonate is causticized for use in subsequent first-mentioned cooking, and the rest of the solution is used for subsequent second-mentioned cooking.

1059. 312,336. June 16, 1931. George A. Richter. Liberation of fiber.

Raw cellulosic material is cooked in a non-acid solution of sodium sulphite without complete liberation of fiber, and the liberation is completed by cooking in an alkaline liquor containing sodium hydroxide and sodium sulphide. The spent liquors from both cooking steps are mixed, and the inorganic content of the mixture melted in a reducing atmosphere to produce sodium carbonate and sodium sulphide. The sodium carbonate is separated from the melt and treated with sulphur dioxide and water to produce a non-acid sulphite liquor for subsequent first-mentioned cooking, and the rest of the melt is causticized and used for subsequent second-mentioned cooking.

1060. 312,772. June 30, 1931. George A. Richter. Refining raw cellulose.

Raw cellulosic material is cooked in a kraft liquor to liberate the fiber; the spent liquor is separated from the resulting pulp; the inorganic content of the spent liquor is melted to produce sodium carbonate and sodium sulphide; the sodium carbonate is selectively crystallized; the raw pulp is treated with a lignin-reactive reagent, the pulp digested in a solution of the crystal sodium carbonate and the pulp is then digested in the mother solution of the melt.

1061. 314,640. Aug. 25, 1931. Charles L. Wagner. Furnace for recovery of black liquor.

For furnacing waste black liquors of the "Kraft" or sulphate pulp industry, the make-up chemicals or salt cake is delivered to the furnace in closer proximity to the fuel bed by means of an air jet and a small portion of sprayed liquor is added to the entering jet of airborn chemical. This cools the surface of the fuel bed and prevents flaming combustion with consequent oxidation and preserves a more highly reducing atmosphere through the fuel mass.

1062. 315,640. Sept. 29, 1931. George A. Richter. Processing of raw cellulosic material.

Raw cellulosic material is digested at elevated temperature in a sulfurous acid liquor and a sodium-base oxidizing agent is added to the hot liquid. Sodium-base alkali compounds, including sodium hydroxide and sodium sulphide, are added to render the liquor alkaline and the material is digested at elevated temperature in the alkaline liquor. The resulting pulp is separated from the spent liquor and the inorganic content of the spent liquor smelted in a reducing atmosphere. The smelted compounds are causticized for reuse.

1063. 315,641. Sept. 29, 1931. George A. Richter. Processing of raw cellulosic materials.

Raw cellulosic material is cooked in a sulfurous acid liquor. Alkali, including sodium sulphide, is added to the liquor to render it alkaline and the cooking of the cellulosic material is continued. The resulting pulp is separated from the spent liquor and the sodium constituent of the spent liquor is smelted in a reducing atmosphere to produce sodium carbonate and sodium sulphide. The sodium carbonate is selectively crystallized and it and the rest of the smelt are again used in the process.

1064. 334,466. Aug. 1, 1933. George A. Richter. Treating spent cooking liquor.

The inorganic content of spent pulp-cooking liquor is melted in a reducing atmosphere to produce sodium carbonate and sodium sulphide, the hot melt is delivered into water and cooled to crystallize sodium carbonate. The crystallized sodium carbonate is removed from the mother liquor, which is used for the production of fresh cooking liquor.

1065. 334,620. Aug. 8, 1933. Guy C. Howard. Processing waste sulphite liquor.

To waste sulphite liquor is added a mixture of solid calcium hydroxide, a solid inorganic calcium salt and a solid lignin-containing material which has been precipitated

from waste sulphite liquor by means of calcium hydroxide to dissolve said lignin-containing material and precipitate inorganic calcium salts. Sufficient reagent is added to bring the liquor to, but not substantially beyond, the hdyrogen ion value at which a flocculated precipitate first occurs. The solids are separated from the liquor, which is treated with fresh calcium hydroxide substantially free from admixed lignin-containing material, to precipitate a large part of the lignin. The precipitate is separated from the liquid.

1066. 336,325. Oct. 10, 1933. Clinton K. Textor. Paper pulp.

Wood chips are treated, at an elevated temperature, with a liquor containing sodium sulphite as its principal reagent and also containing a carbonate of sodium; the residual liquor is separated and concentrated and the product is carbonized or melted. The sodium compounds thus formed are dissolved in water and the solution is treated to form a liquor containing sodium sulphide as its principal reagent and also containing a carbonate of sodium. Some carbon dioxide is preserved in the solution in a free or loosely combined form. The wood is treated with the resulting liquor.

1067. 336,326. Oct. 10, 1933. Clinton K. Textor. Paper pulp.

Wood chips are digested with a liquor of an alkalinity not less than hydrogen ion concentration 7.5, which contains 30 to 40 lbs. of sodium sulphite and 1.3 to 2.6 lbs. of sodium carbonate per 100 lbs. of oven-dried wood. From ¼ to ¾ cu. ft. of liquor is used per cu. ft. of wood chips in the digester, at a temperature 175° to 188°, for 3-7 hours. The base of a soda-containing waste black liquor from the digestion of the wood is recovered by adding to the liquor a material containing sodium hydroxide, evaporating the liquor to a sirupy concentrated form, and incinerating, whereby the sodium content is converted substantially all into sodium carbonate. The carbonate is leached from the ash and the leach liquor treated with a predetermined amount of sulphur dioxide to form sodium sulphite from a portion of the sodium carbonate and to convert the remainder into sodium bisulphite.

1068. 338,029. Dec. 19, 1933. James J. O'Connor and Donald F. Morris. Paper.

A body filler comprising a finely divided, slowly settling, nonfurnaced and uncarbonated lime sludge precipitate obtained in the recovery of pulp-cooking liquor by causticization with high-calcium lime is mixed with a fibrous furnish and the admixed material is used in the manufacture of paper.

British Patents

319,747. Sept. 27, 1928. *See* Norwegian 47,843.

1069. 335,371. July 15, 1929. E. L. Rinman. Treating waste liquors from soda or sulphate pulp manufacture.

Waste liquors are treated with oxides or hydroxides of barium or strontium or both, preferably mixed with those of calcium, magnesium, aluminum, zinc or iron, before dry distillation, and neutral substances such as carbon powder or alkaline earth carbonates may be added. The product is preferably evaporated to a non-sintered mass below 150°, crushed and then fed through a distillation furnace heated to 600-700° at one end and 200° at the other end (steam at 500° being introduced into the hotter end) and the distillate thus formed may comprise methyl alcohol, acetone, methyl ethyl ketone, acetone oil, other heavy oils and hydrogen, contaminated with cercaptans and sulfides if sulfate lyes are used. Soda may be recovered from the distillation residue, and various details of procedure are given.

1070. 336,984. April 18, 1929. W. Sailer. Tanning compositions.

Sulphite cellulose lye, phenols, cresols and natural tanning substances such as a bark extract are caused to react with enzymes such as phenolases, peroxyidases or dihydrases and with substances yielding oxygen such as hydrogen peroxide or perborates. The products may be further treated with halogens and are suitable for use preliminary to chrome tanning.

1071. 337,377. April 30, 1929. W. Sailer. Tanning.

Hides are treated with a liquor prepared by treating sulphite cellulose lyes with oxidizing compounds such as perborates or persulphates followed by treatment, about two hours later, with chlorine or bromine. Pelts may be preliminarily treated with the liquor and then depilated.

1072. 341,358. April 24, 1929. Zellstoffabrik Waldhof and M. Gade. Sulphite liquor fermentation.

After fermentation, the first runnings in distillation (containing aldehyde) are conducted to fresh mash which is fermenting or is to be fermented. It is assumed that the aldehyde is converted to alcohol.

1073. 341,733. The Mead Pulp and Paper Company. Filler for paper.

Lime sludge from the regeneration of waste liquors is used as a filler.

1074. 341,861. Dec. 13, 1928. E. R. Darling. Active carbon from cornstalks, etc.

Material such as cornstalks is digested with alkali, and the residual liquor is dried and destructively distilled at a temperature not above 300° (the remaining porous carbon serving as a source of active carbon). The residual liquor is preferably acidified before evaporation to precipitate water-insoluble pentosans, and the liquid is then spray-dried and distilled to obtain a fuel gas and organic compounds.

1075. 342,119. Nov. 30, 1929. Papeteries Navarre. Formic acid and alkali metal compounds from cellulose purification liquors.

The liquor which has been used for purifying cellulose as described in British 318,868 is treated with an acid or acid salt such as sulphuric acid or sodium bisulphate, and formic acid is distilled off. Sodium sulphate is recovered from the residue by lixiviation before or after calcination.

1076. 342,545. Feb. 12, 1930. J. Holmes and A. Kingcome. Rotary furnace for soda recovery from spent liquor of paper manufacture, etc.

Structural and mechanical features.

1077. 343,238. Dec. 14, 1929. H. Menz. Fuel for internal-combustion engines.

Alcohol is used with benzene, tetrahydronaphthalene, water, sulphite-cellulose liquor and sulphonated whale oil. The sulphite liquor and oil are stated to prevent rusting and the oil also serves as a lubricant.

1078. 344,282. June 29, 1929. Metallges. A.-G. purifying waste waters from coking plants or cellulose or other factories.

A process utilizing an adsorbent, as described in British 305,657, is carried out with exclusion of air or other gases from the adsorbent, so far as possible, during the adsorption and extraction stages and transition from one stage to another. Various details of operation are described.

1079. 346,813. Jan. 3, 1930. S. P. Cane, H. Heather and L. G. S. Hebbs. Cellulose for paper from broussonetia papyrifera.

The felled trees are soaked in water or dilute alkali (such as waste liquor from digestion) with or without heating, the bark is then separated and the bark and wood are digested separately with sodium hydroxide.

1080. 348,315. MARCH 29, 1930. IMPERIAL CHEMICAL INDUSTRIES, LTD. AND H. M. BUNBURY. USE OF TALL OIL, ETC., IN CORE BINDERS.

Tall oil or liquid rosin, formed as a by-product in the manufacture of cellulose from wood, may be used alone or with linseed oil or other drying oil, pine oil or other solvent, dextrin, molasses, glue, starch, alkali, etc., and may be emulsified with an alkali, carbon monoxide linoleate, etc.

1081. 349,466. FEB. 25, 1930. C. B. THORNE. APPARATUS FOR SCREENING AND FILTERING SOLID PARTICLES FROM THE WATER OF PULP MILLS, PAPER MILLS, CELLULOSE PLANTS, ETC.

Numerous structural details are described.

1082. 352,542. APRIL 11, 1930. L. RUDEMAN. BRIQUETTED FUEL FROM PEAT, ETC.

Peat is dried to a water content of 40-60%, broken up, mixed with about 2.6% (based on the weight of finished briquets to be made) of pitch and with material such as creosote, carbolic acid, waste sulphite lye or heavy coal-tar oils introduced with compressed air treated with superheated steam at 200-400 deg. in a pug mill and then briquetted. Apparatus is described.

1083. 354,951. MAY 23, 1930. E. L. RINMAN. ALKALI RECOVERY FROM WASTE LYES OF SODA OR SULPHATE PULP MANUFACTURE.

Oxides of barium or strontium mixed with calcium oxide are added in pulverized state to the concentrated hot waste liquor, and the resulting pulverous mass may be subjected to dry distillation. Various details of procedure are described.

1084. 361,697. OCT. 13, 1932. ERIK L. RINMAN. PURIFYING WASTE CAUSTIC SODA LIQUORS.

The waste liquor from the digestion of cellulosic raw material with sodium hydroxide lye, with or without sodium sulphide, sodium sulphate or sodium sulphite, is free from silica by adding to the digester liquor, before or during digestion, one or more oxides or hydroxides of metals forming insoluble silicates, e.g., aluminum, calcium, zinc, magnesium, the silica being precipitated as silicate on the cellulosic fibers. Alternatively aluminum hydroxide may be added in solution in sodium hydroxide or as bauxite.

1085. 364,314. DEC. 18, 1930. ALEXANDER MELVILLE, JAMES T. MILLAR AND ROBERT S. T. HENRY. HEAT- AND SOUND-INSULATING COMPOSITION.

The composition is a mixture of paper-mill waste ("lime sludge," which is carbon and calcium carbonate and (or) "machine sludge," which is cellulose and china clay) and kieselguhr or its equivalent, and, if desired, asbestos.

1086. 365,779. JAN. 20, 1930. HEINRICH KOPPERS A.-G. REFRACTORY SUBSTANCES.

Refractory bricks, etc., are made by burning a mixture of sintered magnesite, a binder, e.g., concentrated waste liquor, and a small proportion, e.g., 1-3%, of chrome iron ore, which stabilizes the impurities, e.g., calcium silicates, in the magnesite.

1087. 365,844. FEB. 25, 1931. ERWIN MEYER AND UDDEHOLMS AKTIEBOLAG. EMULSIONS.

Aqueous emulsions are prepared by using as the sole emulsifying agent turpentine oil, preferably that obtained from the sulphate cellulose or charcoal industries. In examples, colophony, liquid rosin, paraffin and bitumen-asphalt are emulsified with water. The products are usable for impregnating wood, paper, textiles, sizing paper, application as plasters to the skin in case of burns, and, in the case of the bitumen-asphalt emulsion, road making, coating wood, etc.

1088. 366,114. MAY 14, 1930. HERMANN SALMANG. REFRACTORY COMPOSITIONS.

Tridymite stones are prepared from sand or quartzite by incorporation of calcium oxide, an alkali oxide and another oxide, e.g., of iron, manganese, magnesium, phosphorus or molybdenum, and heating. In an example silica of which 50% is finely ground, is mixed with sulphite lye, chalk 2, soda 1.5 and iron oxide 1.5% dried, melted and burnt 20 hours at cone 15-16.

1089. 369,985. NOV. 29, 1930. IMPERIAL CHEMICAL INDUSTRIES, LTD., HUGH M. BUNBURY AND RICHARD P. MCGLYNN. EMULSIFYING AGENTS.

Tall oil derivatives are obtained by partially or completely esterifying tall oil or "liquid rosin" by heating it with a polyhydric alcohol, preferably in the presence of an esterification catalyst, e.g., calcium or magnesium glycerate, and treating the resulting ester with a sulphonating agent at not substantially above 40° to form the sulphuric ester. Among examples tall oil is esterified by heating with glycerol and magnesium oxide in an atmosphere of carbon dioxide and treated with sulphuric monohydrate at 35°.

1090. 370,752. JUNE 26, 1931. ROBESON PROCESS CO. MANUFACTURE OF VARNISHES, SOLID PLASTICS, ETC., FROM SULPHITE WASTE LIQUOR.

Dry or liquid products containing the characteristic lignosulphonates of sulphite waste liquor (preferably freed from lime) are heated under pressure with a phenol, such as carbolic acid, and an aldehyde, such as formaldehyde or furfuraldehyde, in the presence, if desired, of an acid catalyst such as ammonium chloride, giving a thermoplastic water-insoluble, alcohol-soluble condensation product.

1091. 372,769. MAY 5, 1932. ARNOLD IRINYI. EVAPORATOR FOR LIQUIDS EASILY DECOMPOSABLE BY HEAT, *e.g.*, TAR, OILS, SULPHITE LIQUOR.

1092. 376,654. JULY 14, 1932. PATENTAKTIEBOLAGET GRÖNDAL-RAMÉN. RECOVERY OF SULPHITE LYES, ETC.

A part of the combustion residue of the waste liquor, freed from sulphides and thiosulphates, is dissolved in water. Sulphur dioxide and calcium carbonate are added to this solution until all the alkali salts are transformed into bisulphite. This solution is then treated with further amounts of the aqueous solution of the melt until the calcium salts in solution are precipitated and the alkali salts in the second solution are transformed into bisulphite or sulphite.

1093. 380,538. FEB. 23, 1932. SOCIÉTÉ DES CONDENSEURS DELAS. SCALING EVAPORATOR TUBES.

In order to keep the heating surface of the tubes of an evaporator clear of scale, the tubes are arranged in the form of a squirrel cage, and each tube is surrounded by another tube of about twice its diameter. The outside tubes are threaded on loosely, and perforated. As the squirrel cage is rotated the outside tubes roll on the heating tubes and break off the scale that falls into the bottom of the evaporator.

381,697. SEPT. 19, 1931. *See* United States Patent 1,879,503.

1094. 389,218. MARCH 16, 1933. PATENTAKTIEBOLAGET GRÖNDAL-RAMÉN. WASTE SULPHITE LIQUORS.

Waste liquors having a high organic substance content are obtained by a preliminary digestion of pine, fir, etc., with a solution of sulphites and (or) bisulphites of alkali metals at a suitable temperature and a final digestion with a solution containing sulphur dioxide and waste liquors or washing water from precious processes; this enables use of free sulphur dioxide for a short time only even if the temperature is too low for substantial amounts of sulphuric acid to be formed and facilitates recovery of the alkali metal sulphites and bisulphites, the high content of organic substances allowing evaporation, etc., by utilization of the heat of combustion thereof. An example is given.

(*To be continued*)

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Alkaline Process

Study of the Coloring Substances in Sulphate Pulp. J. Palmen. Finnish Paper Timber J. 17, Special issue: 312, 314-316, 318 (April, 1935).—This is a discussion of the dissertation of W. F. Holzer published in Paper Trade J. 99, no. 12:91-103 (Sept. 20, 1934) and the previous research by G. M. Kuettel on this subject.—C. J. W.

Wood Pulping Process. George A. Richter assignor to Brown Co. Can. pat. 347,993 (Feb. 5, 1935).—Wood chips are impregnated at room or at elevated temperature under atmospheric or super-atmospheric pressure with a liquor containing sodium sulphide, caustic soda and (or) sodium carbonate. The total alkalinity may be, in sodium equivalents, about 4 to 5 lbs. per cu. ft. and the impregnating conditions may be such as to get into the chips about 0.10 to 0.20 lb. of sodium oxide equivalents per lb. of dry wood. After impregnation the excess liquor is drained off and the chips are digested in a sodium sulphite cooking liquor of about 4 to 10% strength in amount to associate, say, about 0.2 to 0.8 lb. of sodium sulphite per lb. of dry wood. The chips are digested at 335° to 360° F. for 3 hrs. The digested pulp has excellent strength, particularly high Mullen test, and good tear resistance. It contains comparatively few shives and can be bleached to a white product of excellent paper-making properties.—A. P. -C.

Cooking of Kraft Pulp with Improperly Settled White Liquor. Otto Kress and Ward D. Harrison. Paper Trade J. 100, No. 22:30-34 (May 30, 1935).—Kraft cooks made with liquors to which calcium carbonate sludges and clay had been added, respectively in order to simulate cooks made in the mill with improperly settled liquor, gave pulps showing a loss in strength and having an undesirable gray color, and resembling commercial pulps made with improperly settled liquor. The undesirable characteristics of such pulps are due to the presence of mechanically entrained calcium carbonate which can be removed from the pulp by improved washing conditions. —A. P. -C.

New Process for the Manufacture of Chemical Straw Pulp. Raymond Furnier. Papeterie 57: 445-446 (May 25, 1935).—A criticism of the process of Dupont and de Fayard consisting in cooking straw with black liquor from the pulping of wood. The yields of 57 to 72%, which are claimed by the inventors, are exaggerated, or indicate that the straw was undercooked. Doubt is cast on the values of 8,000 to 10,000 m. breaking length for straw pulp reported to have been obtained in laboratory pulping tests.—A. P. -C.

Importance of Sulphate Soaps As Raw Material in large-Scale Production. E. Pyhala. Finnish Paper and Timber J. 1934:697-701; Svensk Pappers-Tidn. 37:574-576 (1934); Mat. grasses 26:10290-10292, 10317-10319 (1934); C. A. 29:3831.—Crude soap has had varied uses as a by-product in the manufacture of sulphate cellulose. In some industries it is ashed to regenerate the sodium salts. Recently in many industries the crude soap is partially purified and treated with dilute sulphuric acid to separate the liquid resins. These on vacuum and steam distillation yield 70-75 percent pine oil and 25-30 percent sulphate pitch. Methods of bleaching the resins are described.—C. J. W.

Results from the B. & W.-Tomlinson Process for the Recovery of Chemicals and Heat from Kraft Black Liquor. L. S. Wilcoxson. Paper Trade J. 100, No. 24; 72-77 (June 13, 1935).—A brief account of the construction and operation to date of the B. & W.-Tomlinson unit installed at the Windsor Mills, Que., plant of Canada Paper Co.—A. P. -C.

Utilization of the Waste Heat in the Recovery of the Liquor in the Pulp Industry. Heinrich Seegers. Papier-Fabr. 33, No. 7:68-70 (Feb. 17, 1935).—The difficulties arising from the large quantities of soda and salt particles adhering to the heating tubes has been completely eliminated in a new heat interchange or economiser, Swedish patent no. 76,383, which is described in full.—J. F. O.

Device for Soda Smelt Ovens Attached to Rotating Ovens. L. Gloersen, Pitkaranta, Finland. Swed. pat. 82,000 (Aug. 5, 1930).—The part of the soda smelt oven extending into the rotating oven is built of fire brick with a water cooling jacket.—J. F. O.

Blower Form for Soda Smelt Ovens and Similar Apparatus. K. G. Johnson, Oestrand. Swed. pat. 82,103 (June 28, 1933).—The form is made of fire-proof material which is resistant to the chemicals it comes in contact with.—J. F. O.

Process for the Continuous Distillation in Vacuum of Liquid Rosin and Oils Obtained As a By-Product in the Manufacture of Sulphate Pulp. Bergstrom & K. N. Cederquist, Stockholm. Swed. pat. 81,898 (Nov. 24, 1930).—J. F. O.

Sulphite Process

Sulphur for Sulphite Pulp Production. M. N. Renzin and V. V. Naumov. Bumazhnaya Prom. 14, no. 1:74-81 (1935); C. A. 29:3831.—Technical and economical advantages of using sulphur instead of flotation pyrites tailins are discussed.—C. J. W.

Process for the Manufacture of Bisulphite Liquor. Patentaktiebolaget Grondal Ramen, Stockholm. Ger. pat. 603,686 (March 11, 1933).—Similar to Nor. pat. 54,016 of March 4, 1933.—J. F. O.

Process and Device for the Manufacture of Calcium and Alkali Bisulphite Solutions. A/S/ Sulfitpatenter, Meldal. Nor. pat. 54,016 (March 4, 1933).—A finely divided slurry of calcium oxide in a suitable medium, water for calcium bisulphite and a sodium salt solution for alkali bisulphite solution, is introduced into a battery of absorption or reaction chambers where it comes in contact with sulphur dioxide gas in a counter current system.—J. F. O.

Process for the Indirect Heating of the Sulphite Liquor Used in the Manufacture of Pulp. Hans Rabus, Heidenheim. Ger. pat. 606,018 (Feb. 22, 1933).—The liquor to be heated is led through several sections of pipe connected in series, each with independent heating bodies,

so regulated that there is a gradual rise in temperature.—J. F. O.

Analysis of the Sulphite Cooking Liquor. K. Haug. Papir-J. 22, no. 22:252-255 (Dec. 15, 1934).—The author criticizes the deficiencies of the existing methods for determining the total and free sulphur dioxide in the cooking liquor which is withdrawn from the digester during the operation. He describes his own method which he claims is sufficiently accurate for mill control. To an Erlenmeyer flask of 250 cc. capacity 200 cc. distilled water and 10 cc. of the cooking liquor are added and well mixed and then enough water to reach the mark. 25 cc. of this solution are transfered to another flask, mixed with starch and titrated with 0.1 N potassium iodate till the color changes. The number of cc. multiplied by 0.32 indicates the percentage of total sulphur dioxide in the liquor. An equal amount of potassium iodate as before is added and another titration is carried out with 0.1 N sodium thiosulphate. The number of cc. of the thiosulphate consumed multiplied by 0.32 indicates the percentage of free sulphur dioxide in the solution. The difference between the total and free sulphur dioxide gives the combined sulphur dioxide which, when multiplied by 7/8, indicates the percentage of calcium oxide present in the liquor.—C. J. W.

Composition of the Gases Formed in the Sulphite Process. Al. Krüger. Finnish Paper and Timber J. 1935:58, 60-62; C. A. 29:4172.—Literature references usually give the composition of the gases evolved in sulphite pulp cooking as mainly sulphur dioxide with water vapor. Tests in a 70 cubic meter digester with birch chips, producing 5.4 metric tons of pulp, cooking liquor containing 2.72 percent total sulphur dioxide, cooking time 10 hours 50 minutes, showed that the gases formed contained nitrogen, carbon dioxide and sulphur dioxide, that the nitrogen content corresponds to that of the quantity of air left in the digester after filling with chips and liquor, that the carbon dioxide set free during cooking is about 1.5 percent by weight of the quantity of pulp obtained, that atmospheric oxygen is consumed after filling with cooking liquor, perhaps with formation of gypsum and that a continuous formation of carbon dioxide during cooking renders impossible finishing the process without gassing.—C. J. W.

Calculations for Heat Exchanger and Boiler Installation for a Sulphite Pulp Mill. J. Kuusinen and I. Kjellman. Papier-Fabr. 33, No. 2:13-16 (Jan. 13, 1935).—By means of numerous curves and equations, the authors show that by lowering the peak steam load which occurs during the pre-heating of the digester, it is possible to choose smaller boiler installations. However, in order to hold the same total time for digester heating, an ample sized pre-heater is necessary and thus the final heatings are carried through correspondingly quicker with a smaller heat difference between liquor and steam.—J. F. O.

Process for the Decomposition of Fiberous Plant Materials. Leopold Enge, Niederschreiberhau. Ger. pat. 610,639 (March 24, 1934).—The fiberous materials, drenched with sodium mono-sulphite solution is steamed with acidified water vapor so that the sulphur dioxide bound in the sulphite is wholly or partially freed. The drenching solution contains 10 to 15 percent sodium sulphite, and the steaming time is 2 hours at a temperature of 150 to 155°C, which can be followed with a period of lower temperature heating.—J. F. O.

Process for the Manufacture of Pulp. D. Westad, Bygdoey. Nor. pat. 54,017 (March 9, 1933).—In order to produce a pulp of uniform and completely cooked stock and in a considerable shorter time; the wood chips are drenched before the cooking at a high pressure (preferably 10 to 30 atmospheres) and a relatively low temperature (between 5 and 70°C) with cooking acid and then cooked at high pressures (preferably 10 to 15 atmospheres).—J. F. O.

Process and Device for the Cooking of Sulphite Pulp. Sjune Svensson, Krokom, Sweden, Nor. pat. 54,043 (Oct. 21, 1932).—Means of circulating and introducing steam and sulphur dioxide gas.—J. F. O.

Changes in Fiber Structure During Certain Stages of Sulphite and Sulphate Cooking. Erik Hagglund. Svensk Pappers-Tidn. 38, no. 5:145-148, 151-152, 157-158 (March 15, 1935).—In a laboratory study of sulphite cooking using the conditions approximately similar to the Mitscherlich process, the author obtained from two parallel cooks pulps which varied greatly in strength characteristics. The light colored waste liquor and the relatively high-white pulp did not indicate overcooking. Further study showed that the weaker pulp was produced when the autoclave was rotated and when the ratio of liquor to chips was high. Fibers from such a pulp appeared to break into small pieces as soon as a Lampen mill treatment was applied. Photomicrographs revealed that these fragments were of a size corresponding with the distance between cross elements of the fiber. The weak fibers appeared to have been separated from the softened chip during the cook, this separation being encouraged by ready circulation within a rotating digester. Chemical investigation disclosed relatively high viscosity as characteristic of the fibers in a softened chip, while fibers released from the chip during cooking showed a low viscosity. Correspondingly, the former fibers showed excellent ballooning between cross elements when swelled with cuprammonium solutions, while the latter fibers were represented only by fragments after the swelling treatment. The ballooning depends on the presence of semipermeable membranes encircling the fiber and forming the constrictions. Certain investigators have erred in the belief that these membranes provide the forces holding the fiber together and even affect the viscosity and that this latter accordingly bears no relation to the magnitude of the cellulose molecule. Such a view is opposed by Staudinger. In the author's opinion, the cellulose miscelles, fibrillae and fibers surrounding the above mentioned membrane which forms the constriction during ballooning are attacked by the cooking acid. Thus, these outer membranes do not affect the viscosity but those which surround the cellulose miscelles are responsible. One should, therefore, not always expect a parallel between the fiber strength and viscosity. Investigation of kraft cooking along similar lines show that the fibers gave a bruised appearance rather than actually breaking at the cross element.—C. J. W.

The Electrolytical Conductivity in Calcium Bisulphite Solutions at 20° C. System Cao — SO_2 —H_2O. G. K. Bergman. Finnish Paper Timber J. 17, Special Issue:290-293 (April, 1935).—The electrolytic conductivity in pure sulphite cooking acids has been determined; from the data the composition of pure cooking liquor can be ascertained by an iodometric analysis and a conductivity determination.—C. J. W.

Sulphite Cooking, Concerning Especially the Effect of the Acid Composition on Yield, Quality and Sulphur Consumption. J. W. Bergman. Svensk Pappers-Tidn. 38, no. 7:215-218 (April 15, 1935).—Among the conclusions resulting from a sulphite cooking study the following are of interest. Increased base content in the cooking liquor gives a higher yield of more easily defibered pulp; such a pulp is whiter and softer at higher bleachability than one cooked to a lower bleachability with a low base liquor. Doubling the base content involves a 50 percent

increase of sulphur in the liquor, which amount cannot be recovered in the relief gases. The increased yield is almost exactly offset economically by the cost of the increased chemicals.—C. J. W.

Formation of Sugars and Their Decomposition During the Sulphite Cooking Process. E. Hägglund and H. Nihlén. Finnish Paper Timber J. 17, Special Issue: 294, 296-298, 300 (April, 1935).—In the manufacture of pulps of identical cooking degree, the yield of sugars from the sulphite cooking process depends upon the acidity and lime content of the sulphite liquor as well as upon the mode of increasing the temperature during the cook. Experimentally determined differences in sugar yields check well with theoretical values.—C. J. W.

Production of Paper From Waste Tan Bark Oak. Technological part. A. O. Giller Economic part. M. Ya. Marshak. Tzentral. Nauch.-Issledovatel. Inst. Bumazhnoi Prom. Materialui 1934, no. 3:72-93, 93-122; C. A. 29:4172.—Semicommercial experiments with sulphite pulping of waste oak chips from tannin-extracting plants, bleaching of the pulp and converting it into paper led to the following conclusions: Sulphite cooking of Maikop waste tan oak gives difficultly bleachable pulp, which requires considerable quantities of chlorine. Bleached and unbleached waste oak pulp are excessively contaminated and show poor mechanical properties. Paper prepared from waste tan oak chips, sorted out at a uniform size, is less contaminated and shows a greater mechanical strength than the paper obtained from the waste tan oak freed from contaminating bark and finer particles of wood. The addition of 40 percent of sulphite or sulphur pine pulp to the waste tan oak results in a paper with the tearing strength increased 1.5-2 times and the contamination decreased 2-3 times. Even with 40 percent of pine pulp, the waste tan oak paper is not suitable for writing or printing uses. The yield of bleached sulphite pulp on absolutely dry waste tan oak is very low, viz., 27.7-29.9 percent. The method of sulphite pulping of waste tan oak and the resulting paper is inferior to those of the sulphate method. The economical aspects of sulphite pulping of waste tan oak at the tannin-extracting plants, or their vicinity, and of the production of low-grade sulphite paper and carton from the waste tan oak are discussed.—C. J. W.

Cellulose for Printing and Writing Papers. A. I. Kardakov. Bumazhnaya Prom. 14, no. 2:23-33 (1935); C. A. 29:4937.—Recommendations for the improved production of paper are based on the review of the advances made in the study of the chemistry of sulphite cooking and cellulose.—C. J. W.

Removal of Pitch From Sulphite Pulp. Aleks Lampen. Finnish Paper and Timber J., Special Issue:279-286 in English, 286-288 (April, 1935); C. A. 29:4936.—Pitch appears in the sulphite pulp mills as foam in the stock lines; this indicates that at least a part of the pitch is distributed among the fibers as a free suspension. During the cooking process the pitch is a liquid spread among the fibers and becomes a semisolid during the washing out with cold water. In 1931 an apparatus working on the principle of fractionating treatment of pulp was installed at Tornator and has proved very satisfactory. A diluted pulp (TO) is led into the upper part of the apparatus, where it comes in contact with a wing which throws it against a screen. The latter allows free passage for the water with the pitch suspension and the detained fibers are speedily removed through a number of openings as pulp fraction (L) to prevent the formation of a filter. The water still contains fibers which are then removed on fine screens as pulp fractions (H) and (O). The pitch contents of the different pulp fractions are: (T) 1.25, (L) 0.70, (H) 5.50, (O) 18 and for the original cellulose 1.12 percent. Repeated treatment of (L) in the same apparatus gave a product with 0.09 percent pitch after 5 treatments and represented 75 percent of the original pulp. No pitch trouble results if the pitch content does not exceed 0.80 percent.—C. J. W.

Rosin in Sulphite Pulp. S. Samuelsen. Papir-J. 23, no. 6:63-65; no. 7:71-74 (April 6, 15, 1935).—The author reviews the most important researches dealing with the pitch problem on sulphite pulp. Brief reference is made to Haglund's patented method according to which the rosin content of pine sulphite pulp is lowered to 0.1 percent and of spruce sulphite pulp to 0.4-0.5 percent. His own studies deal with purely mechanical means for lowering the rosin content of the fibers to such an extent that no pitch troubles are experienced later upon the paper machine. Drying the chips at high temperatures or steaming prior to cooking was found successful. Up to 7 percent of the total ether extract can be removed during the gassing of the cook. Repeated washing of the pulp in thickeners is most effective. This procedure involves a certain fiber loss, part of which can be recovered in suitable installations. A decided improvement in the color of bleached sulphite pulp results when as much rosin as possible is removed from the stock.—C. J. W.

Ontario Paper Co. to Build Mill

[FROM OUR REGULAR CORRESPONDENT]

THOROLD, Ont., December 17, 1935—The president of the Ontario Paper Company, Ltd., Arthur A. Schmon, today confirmed reports that the Ontario Paper Company, Ltd., intends to complete the work of building a newsprint plant in the vicinity of Manicouagan. This company has decided to proceed immediately with completion of its water power development on the Outarde River and the construction of a modern ground wood and newsprint paper mill with a daily capacity of 320 tons at Comeau Bay on the North Shore of the Lower St. Lawrence near the Manicouagan River, opposite Rimouski. John Stadler has been engaged as consulting engineer, but the engineering work on the plans and specifications will be performed by the company's engineers at its Thorold plant.

The Ontario Paper Company owns a large tract of pulpwood limits on the Manicouagan watershed and water powers on the Outarde River which are held by lease from the Quebec Government, under which the company is obliged to develop the water power and construct a mill near the basin of the Manicouagan and Outarde Rivers. The time for completing the project has been twice extended during the depression, but substantial sums have been expended on dams, hydraulic works and other improvements.

Specifications are being issued to Canadian and American manufacturers for two paper machines with a trim of 250 inches.

The Ontario Paper Company, Ltd., is an affiliate of the Chicago *Tribune* and the *Daily News* of New York. The newsprint requirements of the publishing companies are in excess of the present manufacturing facilities at Thorold, and for many years the parent companies have been purchasing newsprint from other manufacturers, at market prices, for quantities in excess of 100,000 tons annually. Having regard to the present and future newsprint requirements of the two newspapers the Ontario Paper Company has now decided to proceed at once with the construction of a mill and to complete the development of water powers in conformity with its contract with the Quebec Government. The mill is to be ready for operation by May, 1938.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING DECEMBER 14, 1935

CIGARETTE PAPER

R. J. Reynolds Tobacco So., Pr. Harding, Havre, 175 cs.; Standard Products Corp., Pr. Harding, Havre, 83 cs.; Champagne Paper Corp., Lafayette, Havre, 756 cs.; Almo Trading & Importing Co., Lafayette, Havre, 31 cs.; H. H. Strauss, Ind. Hall, Bordeaux, 182 cs.; Champagne Paper Corp., Indep. Hall, St. Nazaire, 110 vs.

WALLPAPER

F. J. Emmerich, Hansa, Hamburg, 1 cs., 13 bls.; Phoenix Shipping Co., Hansa, Hamburg, 2 cs.; W. H. S. Lloyd & Co., American Banker, London, 17 bls., 2 cs.; ———, Ascania, Southampton, 2 bls.; F. Blank, Washington, Havre, 6 cs.; American Express Co., Aquitania, Southampton, 2 bls.; ———, Europa, Bremen, 9 cs.; F. J. Emmerich, Deutschland, Hamburg, 19 bls.; Globe Shipping Co., Deutschland, Hamburg, 5 cs.; Phoenix Shipping Co., Deutschland, Hamburg, 17 cs.

WALL BOARD

———, Blankaholm, Gothenburg, 1296 bdls.; Johaneson Wales & Sparre, Inc., Blankaholm, Gothenburg, 194 bdls.; Treetex Corp., Hansa, Hamburg, 2756 bdls.

NEWSPRINT

Jay Madden Corp., Blankaholm, Kotka, 409 rolls; Perkins Goodwin & Co., Hansa, Hamburg, 154 rolls; Parsons & Whittemore, Inc., Hansa, Hamburg, 241 rolls; Jay Madden Corp., Hansa, Hamburg, 135 rolls; ———, Stavangerfjord, Oslo, 647 rolls; N. Y. Evening Journal, Cissy, Quebec, 2745 rolls; Parsons & Whittemore, Inc., Isis, Hamburg, 291 rolls; Jay Madden Corp., Pr. Harding, Hamburg, 75 rolls; Jay Madden Corp., Washington, Hamburg, 100 rolls; Perkins Goodwin & Co., Deutschland, Hamburg, 495 rolls; ———, Deutschland, Hamburg, 259 rolls.

PRINTING PAPER

E. Dietzgen & Co., Hansa, Hamburg, 77 cs.; Steiner Paper Corp., Hansa, Bremen, 18 cs.; Steiner Paper Co., Estrella, Marseilles, 2 cs.; Phoenix Shipping Co., Deutschland, Hamburg, 4 cs.

KRAFT PAPER

Arkell Safety Bag Co., Blankaholm, Gothenburg, 150 rolls.

WRAPPING PAPER

E. Dietzgen & Co., Deutschland, Hamburg, 26 cs.; Standard Products Corp., Black Eagle, Antwerp, 2 rolls; F. C. Strype, H. Jasper, Antwerp, 6 cs.; H. Reeve Angel & Co., Inc., H. Jasper, Antwerp, 3 cs.; Chase National Bank, Blankaholm, Gothenburg, 3834 rolls; Guaranty Trust Co., Blankaholm, Gothenburg, 343 rolls; ———, Hansa, Bremen, 17 cs.; Walker Goulard Plehn Co., Washington, Hamburg, 451 rolls, 14 bls.; D. F. Young Co., Inc., Washington, Hamburg, 511 rolls; ———, Washington, Hamburg, 12 cs.; ———, Washington, Havre, 5 cs.

PACKING PAPER

F. C. Strype, Hansa, Hamburg, 13 cs.; C. Happel, Volendam, Rotterdam, 21 cs.; Dingelstedt & Co., Deutschland, Hamburg, 10 cs.; American Express Co., Deutschland, Hamburg, 4 rolls.

FILTER PAPER

C. Schleicher & Schull Co., Hansa, Hamburg, 4 cs.; C. Schleicher & Schull Co., Deutschland, Hamburg, 5 cs.; H. Reeve Angel & Co., Inc., Ascania, Southampton, 15 cs.

METAL COATED PAPER

K. Pauli Co., Hansa, Hamburg, 4 cs.

BARYTA COATED PAPER

Atlantic F'd'g Co., Hansa, Hamburg, 15 cs.; L. A. Consmiller, Hansa, Bremen, 29 cs.; Globe Shipping Co., Hansa, Bremen, 6 cs.

SURFACE COATED PAPER

C. Happel, Hansa, Hamburg, 17 cs.; Gevaert Co. of America, Black Eagle, Antwerp, 21 cs.; Globe Shipping Co., Deutschland, Hamburg, 2 cs.

BASIC PAPER

Dingelstedt & Co., Europa, Bremen, 86 cs.

PHOTO PAPER

American Express Co., Hansa, Hamburg, 48 cs.; J. J. Gavin, Aquitania, Southampton, 8 cs.; American Express Co., Deutschland, Hamburg, 20 cs.

DECALCOMANIAS

Sellers Transportation Co., Hansa, Hamburg, 8cs.; Sellers Transportation Co., Europa, Bremen, 13 cs.; Sellers Transportation Co., Deutschland, Hamburg, 18 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., Britannic, Liverpool, 13 cs. (duplex).

COLORED PAPER

D. C. Andrews & Co., Europa, Bremen, 2 cs.; International F'd'g Co., Deutschland, Hamburg, 12 cs.

TISSUE PAPER

Atlantic F'd'g Co., Hansa, Hamburg, 8 cs.; Van Oppen & Co., Rex, Genoa, 40 cs.; W. J. Byrnes, Washington, Havre, 1 cs.; W. J. Byrnes, Aquitania, Southampton, 3 cs.; American Express Co., Deutschland, Hamburg, 20 cs.

GUMMED PAPER

———, Hansa, Bremen, 7 cs.

PAPER BAGS

———, Regulus, Aalborg, 557 bls.

PAPER TUBES

———, Deutschland, Hamburg, 36 pkgs.

PAPER BOARD

Steiner Paper Corp., Hansa, Hamburg, 8 cs.

PASTE BOARD

Phoenix Shipping Co., Deutschland, Hamburg, 53 bls.

STRAW BOARD

———, Volendam, Rotterdam, 540 bdls.

MISCELLANEOUS PAPER

National Pulp & Paper Co., Inc., Blankaholm, Gothenburg, 684 rolls; M. Sone, Blankaholm, Gothenburg, 490 bls.; Japan Paper Co., Montreal, Maru Kobe, 65 cs.; H. Reeve Angel & Co., Inc., Montreal, Maru, Yokohama, 4 cs.; Keuffel & Esser Co., Hansa, Hamburg, 31 cs.; Walker Goulard Plehn Co., Isis, Hamburg, 96 rolls; Walker Goulard Plehn Co., Volendam, Rotterdam, 10 bls.; Moller Products Corp., Excalibur, Genoa, 9 cs.; Japan Paper Co., American Banker, London, 6 cs.; U. S. Envelope Co., Kano Maru, Yokohama, 21 cs.

RAGS, BAGGING, ETC.

Johns Manville Co., Motomar, Valencia, 104 bls. rags; Royal Manfg. Co., H. Jaspar, Antwerp, 98 bls. cotton waste; H. Schimmel, Montreal, Maru Kobe, 50 bls. cotton waste; ———, Montreal, Maru Kobe, 200 bls. cotton waste; Bingham & Co., Montreal, Maru Kobe, 200 bls. cotton waste Royal Manfg. Co., Montreal, Maru Kobe, 100 bls. cotton waste; W. R. Grace & Co., Montreal, Maru Shanghai, 100 bls. picker waste; Royal Manfg. Co., Montreal, Maru Shanghai, 300 bls. cotton waste; ———, Caledonia, Glasgow, 94 bls. bagging; Darmstadt Scott & Courtney, Isarco, Genoa, 364 bls. bagging; J. J. Ryan & Son Co., Volendam, Rotterdam, 158 bls. cotton waste; Manufacturers Trust Co., Estrella, Barcelona, 75 bls. bagging; ———, Estrella, Barcelona, 47 bls. cotton waste; S. Birkenstein & Son, Estrella, Barcelona, 70 bls. cotton waste; Continental Bank Trust Co., Estrella, Barcelona, 83 bls. rags; Bank of N. Y. Trust Co., Estrella, Barcelona, 37 bls. old cottons; Bank of N. Y. Trust Co., Estrella, Barcelona, 92 bls. bagging ———, Excalibur, Alexandria, 39 bls. bagging; E. J. Keller Co., Inc., Excalibur, ———, 122 bls. bagging; E. J. Keller Co., Inc., Indep. Hall, ———, 227 bls. rags; E. J. Keller Co., Inc., Black Eagle, ———, 121 bls. bagging; J. J. Ryan & Son Co., Black Eagle, Antwerp, 144 bls. cotton waste; Chase National Bank, Yuri, Maru Kobe, 114 bls. rags; J. Cohen & Son Co., American Banker, London, 27 bls. rags.

GLUE STOCK, ETC.

National Adhesives Co., Deutschland, Hamburg, 120 bags ground glue; ———, Deutschland, Hamburg, 100 bags bone glue; ———, Deutschland, Hamburg, 300 bags hide glue; ———, Hansa, Hamburg, 280 bags hide glue.

OLD ROPE

W. Steck & Co., Volendam, Rotterdam, 83 coils; E. J. Keller Co., Inc., Gitano, ———, 58 coils.

CASEIN

———, Southern Cross, B. Aires, 834 bags; ———, Lafayette, Havre, 1006 bags; ———, Indep. Hall, St. Nazaire, 500 bags, 50,330 kilos.

CHINA CLAY

Whitaker Clark & Daniels, Britanic, Liverpool, 390 bags.

WOOD PULP

Lagerloef Trading Co., Blankaholm, Viipuri, 662 bls. sulphate; Lagerloef Trading Co., Blankaholm, Viipuri, 4635 bls. sulphite; Castle & Overton, Inc., Blankaholm, Viipuri, 3849 bls. wood pulp; Lagerloef Trading Co., Blankaholm, Rauma, 2976 bls. sulphite; Lagerloef Trading Co., Blankaholm, Rauma, 860 bls. sulphate; Lagerloef Trading Co., Blankaholm, Rauma, 260 bls. mechanical pulp; Johaneson Wales & Sparre, Inc., Blankaholm, Gothenburg, 254 bls. sulphite; Johaneson Wales & Sparre, Inc., Blankaholm, Gothenburg, 748 bls. kraft soda pulp; J. Anderson & Co., Blankaholm, Gothenburg, 125 bls. sulphite; Price & Pierce, Ltd., Blankaholm, Gothenburg, 500 bls. dry pulp; Perkins Goodwin & Co., Blankaholm, Gothenburg, 279 bls. sulphate; ———, Fechenheim, Halmstad, 1500 bls. sulphite; Stora Kopparberg Corp., Fechenheim, Skutskar, 885 bls. dry pulp; Tradesmans Nat'l Bank Trust Co., Fechenheim, Norrsundet, 625 bls. sulphate; Price & Pierce, Ltd., Fechenheim, Wallvik, 1350 bls. sulphite; ———, Fechenheim, Iggesund, 510 bls. sulphite; ———, Fechenheim, Iggesund, 500 bls. sulphate; Perkins Goodwin & Co., Stavangerfjord Oslo, 1000 bls. mechanical pulp; E. J. Keller Co., Inc., Isis, ———, 336 bls. wood pulp, 50 tons; Castle & Overton, Inc., Isis, Hamburg, 1000 bls. wood pulp, 150 tons; Perkins Goodwin & Co., Pr. Harding, Hamburg, 327 bls. wood pulp, 50 tons; Johaneson Wales & Sparre, Inc., Pr. Harding, Hamburg, 1000 bls. wood pulp, 150 tons; M. Sone, Pr. Harding, Hamburg, 500 bls. wood pulp, 77 tons; Perkins Goodwin & Co., Tyrifjord, Drammen, 500 bls. sulphite; Guaranty Trust Co., Tyrifjord, Drammen, 300 bls. sulphite; Irving Trust Co., Tyrifjord, Drammen, 6000 bls. chemical pulp; Guaranty Trust Co., Tyrifjord, Drammen, 600 bls. sulphite; J. Andersen & Co., Tyrifjord, Oslo, 2835 bls. sulphite; The Borregaard Co., Inc., Tyrifjord, Tofte, 600 bls. sulphate; Atterbury Bros., Inc., Tyrifjord, Tofte, 6600 bls. sulphite; Price & Pierce, Ltd., Tyrifjord, Greaker, 750 bls. sulphite; J. Andersen & Co., Tyrifjord, Greaker, 375 bls. sulphite; Central Hanover Bank Trust Co., Deutschland, Hamburg, 700 bls. wood pulp, 108 tons; Bank of N. Y. Trust Co., Deutschland, Hamburg, 340 bls. wood pulp, 68 tons; ———, Deutschland, Hamburg, 480 bls. wood pulp, 97 tons.

WOOD PULP BOARDS

Jay Madden Corp., Blankaholm, Kotka, 106 rolls; Jay Madden Corp., Blankaholm, Viipuri, 40 bls.; H. Fuchs & Son, Blankaholm, Guttenburg, 139 crates; ———, Hansa, Hamburg, 27 bls.; Griffin Rutgers, Inc., Deutschland, Hamburg, 12 cs.

ALBANY IMPORTS

WEEK ENDING DECEMBER 14, 1935

Parsons & Whittemore, Inc., Carplaka, ———, 910 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING DECEMBER 14, 1935

Royal Manfg. Co., Montreal, Maru Shanghai, 100 bls. cotton waste; Beacon Wiper Supply Co., Montreal, Maru Kobe, 95 bls. rags; Royal Manfg. Co., Britannic, Liverpool, 9 cs. tissue paper; American Express Co., Breedyk, Rotterdam, 185 bls. rags; ———, Breedyk, Rotterdam, 301 bls. rayon waste; R. F. Riley Co., Breedyk, Rotterdam, 12 bls. rags; New England Waste Co., Yuri, Maru Kobe, 250 bls. bagging; E. Butterworth & Co., Inc., Black Eagle, Antwerp, 160 bls. rags; F. J. Fawcett, Black Eagle, Antwerp, 164 bls. flax waste; W. Steck & Co., Black Eagle, Antwerp, 103 bls. jute waste; Royal Manfg. Co., Black Eagle, Antwerp, 315 bls. cotton waste; ———, Black Eagle, Antwerp, 113 bls. rags; E. J. Keller Co., Inc., Black Eagle, ———, 92 bls. bagging; Bulkley Dunton & Co., Fechenheim, ———, 500 bls. wood pulp; Bulkley Dunton & Co., Idarwald, ———, 400 bls. wood pulp; E. J. Keller Co., Inc., Excalibur, ———, 168 bls. paper stock; Parsons & Whittemore, Inc., O. Siemers, ———, 150 bls. wood pulp.

TRENTON IMPORTS

WEEK ENDING DECEMBER 14, 1935

English China Clays Sales Co., N. Y. City, Fowey, 540 tons, 9 cwt. china clay; Moore & Munger, N. Y. City, Fowey, 782 tons, 15 cwt. china clay.

PHILADELPHIA IMPORTS

WEEK ENDING DECEMBER 14, 1935

National Vulcanized Fibre Co., Motomar, Valencia, 188

(Continued on page 55)

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, December 18, 1935.

Sentiment in the local paper market is optimistic. Demand for the various standard grades of paper is fairly persistent considering the approach of the inventory period. Sales forces of the leading paper organizations are planning their 1936 campaign with enthusiasm. Prices are steady to firm.

The position of the newsprint paper market is improving. The total North American production for November amounted to 372,395 tons, compared to 346,189 tons in November, 1934. Stocks at U. S. and Canadian mills on November 30, were 63,387 tons, compared with 87,658 tons on October 31, according to the News Print Service Bureau.

Demand for the various grades of fine paper is well sustained. Book, bond, cover and ledger papers are moving in good volume for the time of year. Tissues are in excellent request and higher prices are predicted, in some quarters. The coarse paper market is displaying strength. Paper board is moderately active.

Mechanical Pulp

The ground wood pulp market is practically unchanged. Manufacturing operations are proceeding in sufficient volume to take care of current requirements. Stocks at the pulp mills are not excessive and the statistical position of the industry is still considered sound. Prices are holding to schedule, without difficulty.

Chemical Pulp

Steadiness prevails in the chemical pulp market. Demand for both domestic and imported grades is holding up well. Bleached sulphite pulp and kraft pulp continue very firm, with offerings limited. The former is quoted at $2.50 to $2.90 and the latter at $1.75 to $1.85, on dock, Atlantic ports.

Old Rope and Bagging

The old rope market is steadier, although paper mill demand for domestic and foreign old manila rope is somewhat restricted. Mixed strings are fairly active. Old rope prices remain unchanged. The bagging market is fairly active for the season. Prices of scrap, gunny and roofing bagging are steady.

Rags

Conditions in the domestic rag market are improving. Demand for new and old cotton rags is brisk, especially for No. 1, white shirt cuttings, which are also in request for export. The imported rag market is sharing the general betterment. Roofing grades, however, are rather quiet. Prices remain unchanged.

Waste Paper

The paper stock market is exhibiting a stronger undertone. Board mill demand for the lower grades is fairly active. Strictly folded news and No. 1 mixed paper are attracting more interest. The higher grades of waste paper are stronger, especially hard and soft white shavings and hard white envelope cuttings.

Twine

Most of the business transacted in the local twine market during the past week consisted of rush orders for Yuletide consumption. The usual short lull is anticipated until after the inventory period. Prices are generally holding to previously quoted levels and reports of concessions are infrequent.

IMPORTS OF PAPER AND PAPER STOCK

(Continued from page 54)

bls. rags, E. J. Keller Co., Inc., Breedyk, ———, 115 bls. rags; ———, New York City, Bristol, 38 tons china clay; English China Clays Sales Co., New York City, Fowey, 712 tons, 8 cwt. china clay; English China Clays Sales Co., New York City, Fowey, 1342 bags china clay; English China Clays Sales Co., New York City, Fowey, 142 casks china clay; Moore & Munger, New York City, Fowey, 324 tons, 12 cwt. china clay; J. Flannery, Excalibur, Alexandria, 170 bls. rags; Darmstadt Scott & Courtney, Yuri Maru, Kobe, 187 bls. rags; D. J. Keller Co., Inc., Yuri Maru, ———, 400 bls. rags; ———, Yuri Maru, Yokohama, 501 bls. rags; Philadelphia National Bank, Black Eagle, Antwerp, 98 bls. rags; ———, Black Eagle, Antwerp, 235 bls. rags; National Vulcanized Fibre Co., Indep. Hall, St. Nazaire, 48 bls. rags; Castle & Overton, Inc., Indep. Hall, St. Nazaire, 164 bls. rags; E. J. Keller Co., Inc., Indep. Hall, ———, 662 bls. rags.

BALTIMORE IMPORTS

WEEK ENDING DECEMBER 14, 1935

Lagerloef Trading Co., Blankaholm, Spjutsuna, 1560 bls. mechanical pulp; ———, Fechenheim, Halmstad, 5000 bls. sulphite; Tradesmans Nat'l Bank Trust Co., Fechenheim, Norrsundet, 499 bls. sulphate; ———, Fechenheim, Iggesund, 1196 bls. wood pulp; ———, Fechenheim, Iggesund, 5150 bls. sulphite; ———, Montreal, Maru Kobe, 334 bls. rags; Philadelphia Nat'l Bank, Yuri Maru, Kobe, 334 bls. rags; Sherman Bros., Yuri Maru, Kobe, 668 bls. rags; J. J. Ryan & Son, Yuri Maru, Kobe, 200 bls. cotton waste; ———, Yuri Maru, Kobe, 124 bls. rags; ———, Yuri Maru, Yokohama, 114 bls. rags;———, Black Hawk, Rotterdam, 480 bls. wood pulp, 100 tons; Castle & Overton, Inc., Black Hawk, Rotterdam, 1685 bls. wood pulp, 294 tons; Congoleum Nairn Co., Indep. Hall, Bordeaux, 402 bls. rags; Congoleum Nairn Co., Indep. Hall, St. Nazaire, 93 bls. rags; Congoleum Nairn Co., Indep. Hall, Havre, 1033 bls. rags; Bulkley Dunton & Co., Etna———, 5625 bls. wood pulp; Bulkley Dunton & Co., City of Baltimore, ———, 1250 bls. wood pulp; Parsons & Whittemore, Inc., City of Newport News, ———, 515 bls. wood pulp.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, December 18, 1935.

BLANC FIXE.—Conditions in the blanc fixe market are fairly satisfactory. Prices are holding to schedule. The pulp is quoted at $42.50 to $45 per ton, in bulk; while the powder is selling at 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER.—The bleaching powder market is exhibiting a fairly strong undertone. Contract shipments are moving in good volume. Prices are steady to firm. Bleaching powder is quoted at $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN.—The casein market is firm. Domestic standard ground is quoted at 15 and finely ground at 15½; Argentine standard ground at 14¾ and finely ground at 15; French standard ground at 14½ and finely ground at 15 cents per pound, in bags, car lot quantities.

CAUSTIC SODA.—Steadiness prevails in the caustic soda market. The contract movement is well up to average. Solid caustic soda is still quoted at $2.55 to $2.60; while the flake and ground are selling at $2.95 to $3 per 100 pounds, at works.

CHINA CLAY.—The china clay market is displaying strength. Contract shipments are moving freely. Prices are firm. Imported china clay is quoted at $13.50 to $21 per ton, ship side; while domestic paper making clay is selling at $6.50 to $12 per ton, at mine.

CHLORINE.—Paper mill demand for chlorine is persistent. The contract movement is fairly heavy. Recently advanced prices for delivery in the forthcoming year are $2.15 to $2.55 per 100 pounds, in tanks, or multi-unit cars, at works.

ROSIN.—The rosin market is easy. Paper making gum rosin is now quoted at $4.25 and wood rosin at $4.40 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent rosin size is selling at $2.52½ per 100 pounds, in tanks, cars, at works.

SALT CAKE.—Most of the business transacted in the salt cake market is routine. Prices are steady. Salt cake is quoted at $12 to $13; chrome salt cake at $11 to $12 per ton, at works. Imported salt cake is selling at $12 to $13 per ton, ship side.

SODA ASH.—The soda ash market is fairly buoyant. Contracts for the coming year are being booked in good volume. Prices are firm. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.05; in bags, $1.20; and in barrels, $1.50.

STARCH.—No radical changes transpired in the starch market. Paper mill demand is fairly active. The contract movement is seasonal. Special paper making starch is quoted at $3.14 per 100 pounds, in bags, and at $3.41 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—Business in the sulphate of alumina market is brisk. The contract movement is normal. Prices are holding to schedule. Commercial grades are quoted at $1.35 to $1.50; and iron free at $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market is steady. Sulphur is quoted at $18 per long ton on orders of 1,000 tons, or over, on yearly contracts and at $20 per ton on any smaller quantity over that period. On spot and nearby car loads, the quotation is $21 per ton.

TALC.—Trading in the talc market is moderately active. Prices are holding to formerly quoted levels. Domestic talc is quoted at $16 to $18 per ton, at eastern mines; while imported talc is selling at $23 to $30 per ton, on dock.

Market Quotations

Paper

Rag Content Bond & Ledgers—Delivered Zone 1	Bonds	Ledgers
100% Rag Ext. No. 1	.36	.37
100% Rag	.28	.29
75% Rag	.21	.22
65% Rag	.18	.19
50% Rag	.15	.16
25% Rag	.12½	.13½

Sulphite Bond & Ledgers—Delivered Zone 1	Bonds	Ledgers
No. 1 Sulphite	7.75	8.75
No. 2 Sulphite	6.75	7.75
No. 3 Sulphite	6.00	7.00
No. 4 Sulphite	5.50	6.50

Book, Cased—		
S. & S. C.	5.35 @	5.75
S. & S. C. Litho	5.60 @	6.00
M. F.	5.10 @	5.50
Coated and Enamel	5.90 @	6.55
Coated Litho	5.90 @	6.55

Tissues—Per Ream—		
White No. 1	.77½ @	.82½
White No. 2	.60 @	—
Anti-Tarnish M. G.	.67½ @	—
Colored	.80 @	—
Kraft	.67½ @	—
Manila	.60 @	—

Manila—		
No. 1 Jute	9.00 @	9.25
No. 2 Jute	7.75 @	8.50
No. 1 Wood	4.00 @	5.25
No. 2 Wood	3.50 @	4.00
Butchers	4.00 @	4.50

Fibre Papers—		
No. 1 Fibre	4.25 @	5.50
No. 2 Fibre	4.00 @	4.75
Common Bogus	1.50 @	3.00
Screenings	2.50 @	3.50

Glassine—		
Bleached	.11 @	—
Unbleached	.09 @	—

(The following Quotations are Delivered New York)

News, per ton—		
Roll, contract	41.00 @	—
Sheets	46.00 @	—

Kraft—		
No. 1 Northern	4.12½ @	4.75
Standard	4.00 @	—
Southern	3.87½ @	—

Boards—per ton—		
News	35.00 @	—
Chip	32.50 @	—
Sgl. Mla. Ll. Chip	45.00 @	47.50
Jute Lined Chip	42.50 @	45.00
Kraft Liners	57.50 @	60.00
White Patent Coated	55.00 @	57.50
Binders Boards	67.00 @	75.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—		
Moist	21.00 @	22.00
Dry	21.00 @	22.00
(F. o. b. Mill)		
No. 1 Domestic and Canadian	18.00 @	24.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—		
Division 1	2.60 @	2.90
Division 2	2.55 @	—*
Division 3	2.50 @	—*

Prime Qualities—		
Class 1. All Prime Easy Bleaching	2.05 @	—*

Other Than Easy Bleaching—		
Class 2. Higher than Standard	2.00 @	—*
Class 3, Standard	1.95 @	—*
Class 4, Lower than Standard	1.90 @	—*

(On Dock, Atlantic Ports)

Kraft No. 1	1.75 @	1.85
Kraft No. 2	1.60 @	1.70
(F. o. b. Pulp Mill)		
Kraft Domestic	1.75 @	1.80
(Delivered)		
Soda Bleached	2.50 @	—

* Add 60 Cents per short ton, dock charges, for Albany; $2.00 for Lake Ports East and $3.00 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1.	6.75 @	7.00
Silesias No. 1	4.50 @	4.75
New Unbleached	7.00 @	7.25
New Soft Blacks	3.00 @	3.25
Blue Overall	5.25 @	5.50
Fancy	2.50 @	2.75
Washables	1.90 @	2.15
Mixed Khaki Cuttings	3.25 @	3.50
O. D. Khaki Cuttings	4.00 @	4.25
Men's Corduroy	1.85 @	2.00
New Mixed Blacks	2.50 @	2.75

Old Rags

White, No. 1—		
Repacked	3.00 @	3.50
Miscellaneous	2.75 @	3.25

White, No. 2—		
Repacked	1.75 @	2.25
Miscellaneous	1.50 @	1.75

Thirds and Blues—		
Repacked	1.75 @	1.85
Miscellaneous	1.45 @	1.55

Roofing Rags—		
No. 1	1.55 @	1.60
No. 2	1.35 @	1.40
No. 3 (bagging)	1.00 @	1.05
No. 4	.95 @	1.00
No. 5A	.90 @	1.00

Foreign Rags

New Rags

New Dark Cuttings	2.00 @	2.25
New Mixed Cuttings	1.80 @	1.90
New Light Silesias	3.75 @	4.00
Light Flannelettes	4.00 @	4.25
New White Cuttings	6.50 @	6.75
New Light Oxfords	3.25 @	3.50
New Light Prints	2.75 @	3.00

Old Rags

No. 1 White Linens	7.50 @	8.00
No. 2 White Linens	6.50 @	7.00
No. 3 White Linens	4.50 @	5.00
No. 4 White Linens	2.25 @	2.50
No. 1 White Cotton	4.25 @	4.75
No. 2 White Cotton	3.25 @	3.75
No. 3 White Cotton	2.50 @	2.75
No. 4 White Cotton	1.90 @	2.15
Extra Light Prints	2.00 @	2.25
Ord. Light Prints	1.75 @	1.85
Med. Light Prints	1.55 @	1.65
Dutch Blue Cottons	2.00 @	2.25
French Blue Linens	2.30 @	2.40
German Blue Linens	2.15 @	2.25
German Blue Cottons	1.70 @	1.80
Checks and Blues	1.70 @	1.80
Linsey Garments	1.95 @	2.05
Dark Cottons	1.50 @	1.60
Old Shopperies	1.00 @	1.05
New Shopperies	1.25 @	1.35
French Blues	2.00 @	2.25

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—		
Foreign	2.05 @	2.15
Domestic	1.75 @	1.85
Wool Tares, light	1.70 @	1.75
Wool Tares, heavy	2.15 @	2.30
Bright Bagging	1.75 @	1.80

Manila Rope—		
Foreign	2.10 @	2.15
Domestic	2.00 @	2.10
Mixed Strings	.85 @	1.00
New Burlap Cut	2.00 @	2.25

Hessian Jute Threads—		
Foreign	2.60 @	2.75
Domestic	2.80 @	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—		
White Envelope Cuttings	2.45 @	2.55
Ordinary Hard White No. 1	2.10 @	2.15
Hard White No. 2	1.90 @	2.00
Soft White No. 1	1.80 @	1.90

Flat Stock—		
Stitchless	.65 @	.75
Over issue Mag	.65 @	.75
Solid Flat Book	.55 @	.60
Crumpled No. 1	.35 @	.40
Solid Book Ledger	1.50 @	1.65
Ledger Stock	.85 @	.90
New B. B. Chips	.30 @	.35

Manilas—		
New Env. Cut	1.70 @	1.80
New Cuttings	1.35 @	1.45
Bogus Wrapper	.40 @	.50

Old Kraft Machine—		
Compressed bales	1.10 @	1.20

News—		
No. 1 White News	1.45 @	1.50
Strictly Overissue	.50 @	.55
Strictly Folded	.32½ @	.35
No. 1 Mixed Paper	.25 @	.27½

GEORGE F. HARDY

Consulting Engineer

305-309 Broadway, New York City, N. Y.

Member—Am. Soc. C.E.—Am. Soc. M.E.—Eng. Inst. Can.

Consultation	Paper and Pulp Mills
Reports	Hydro-Electric and
Valuations	Steam Power Plants
Estimates	Plans and Specifications

HARDY S. FERGUSON & CO.

Consulting Engineers

200 FIFTH AVENUE, NEW YORK CITY

Hardy S. Ferguson .....Member A.S.C.E., A.S.M.E., E.I.C.
Moses H. Teare .....Member A.S.M.E., E.I.C., A.S.C.E.
J. Wallace Tower .....Member A.S.C.E., A.S.M.E.

Consultation, reports, valuations, and complete designs and engineering supervision for the construction and equipment of

Pulp and Paper Mills and other Industrial Plants.
Steam and Hydro-electric Power Plants.
Dams and other Hydraulic Structures.

CHEMIPULP PROCESS, INC.

CHEMICAL PULP MILL ENGINEERS
CHEMICAL PULPING PROCESSES, OPERATING SURVEYS APPRAISALS ESTIMATES
Woolworth Building
WATERTOWN, N. Y.
CANADIAN AGENCY: 403 Crescent Bldg., MONTREAL, P. Q.
PACIFIC COAST OFFICE: 3311 First Ave., So., SEATTLE, WASH.

We Convert Your JOB LOTS AND REJECTIONS

Into items that do not conflict with your Regular Marketing Channels

—Send Us Your Offerings—

PRICED FOR SPOT CASH

HANO PAPER CORP., Long Island City, N. Y.

—ESTABLISHED OVER 40 YEARS—

1864 1935

"EXCELSIOR" FELTS

KNOX WOOLEN CO.
CAMDEN, MAINE

Sold By

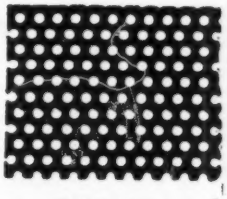
BULKLEY, DUNTON & CO.

75-77 DUANE ST. NEW YORK, N.Y.

OR DIRECT

Perforated Metal Screens

For Pulp and Paper Mills

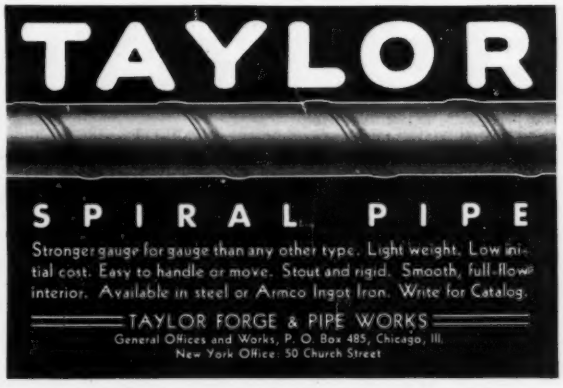


STEEL, COPPER, BRASS, BRONZE, MONEL METAL and other Alloys punched for Centrifugal and Rotary Screens, Pulp Washers, Drainer Bottoms, Filter Plates, etc.

".065" Round

CHARLES MUNDT & SONS

63-65 FAIRMONT AVE. JERSEY CITY, N. J.


TAYLOR
SPIRAL PIPE
Stronger gauge for gauge than any other type. Light weight. Low initial cost. Easy to handle or move. Stout and rigid. Smooth, full-flow interior. Available in steel or Armco Ingot Iron. Write for Catalog.
TAYLOR FORGE & PIPE WORKS
General Offices and Works, P. O. Box 485, Chicago, Ill.
New York Office: 50 Church Street

Twines

(F. o. b. Mill)

(Soft Fibre)

Coarse Polished—

India	.12¾	@	.15¼
Belg. White Hemp	.13¾	@	.14¼
India Compress	.13¾	@	.13¾

Fine Polished—

Fine India	.21	@	.23
Special	.19	@	.21

Unpolished—

Box	.11½	@	.12
Paper Makers	.09	@	.13½
Tube Rope	.09½	@	.14½
Wall Paper	.10½	@	.14
Wrapping	.14½	@	.20½
Special	.14½	@	.15
Soft Fiber Rope	.11¾	@	.12¼

(Hard Fibre)

Bond	.11	@	.19½
Anchor	.10½	@	.12

CHICAGO

Paper

(F. o. b. Mill)

Rag Bond	.12	@	.50
Water Marked Sulphite Bond	.06¾	@	.11
Sulphite Bond	.05½	@	.11
Superfine Writing	.18	@	.24
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07	@	.12
Coated Label	.07	@	.08½
No. 1 Manila	.04¼	@	.05¼
No. 1 Fibre	.04¼	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¼	@	.03¾
No. 1 Kraft	4.75	@	5.00
Southern Kraft	3.88	@	4.25
No. 2 Kraft	3.88	@	4.25
Wood Tag Boards	.04¼	@	.06½
Sulphite Screenings	.03	@	.03¼
Manila Tissue	.05¾	@	.07
White Tissue	.07	@	.09

(Delivered Central Territory)

News, per ton—			
Rolls, contract	41.00	@	—
Sheets, open	46.00	@	48.50
Boards, per ton—			
Plain Chip	46.50	@	—
Solid News	50.00	@	—
Manila Lined Chip	55.00	@	—
Patent Coated	65.00	@	—
Container Lined—			
85 Test, per 1000 sq. ft.			1.70
100 Test, per 1000 sq. ft.			1.85

Old Papers

(F. o. b. Chicago)

Shavings—

No. 1 White Envelope Cuttings	1.70	@	2.00
No. 1 Hard White	1.40	@	1.65
No. 1 Soft White	1.25	@	1.50
Ledger & Writings	.70	@	.80
Solid Books	.60	@	.70
Blanks	1.00	@	1.05
Krafts	.80	@	.90
New Kraft Cuts	1.20	@	1.30
Manila Env. Cuts	1.25	@	1.30
Ex. No. 1 Manila	.90	@	1.00
Print Manila	.40	@	.50
Overissue News	.40	@	.45

Old Newspapers—

No. 1	.30	@	.35
No. 1 Mixed Paper	.25	@	.30

Roofing Stocks—

No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper

Rag Content Bond & Ledgers—
Delivered Zone 1

	Bonds	Ledgers
100% Rag Ext. No. 1	.36	.37
100% Rag	.28	.29
75% Rag	.21	.22
65% Rag	.18	.19
50% Rag	.15	.16
25% Rag	.12½	.13½

Sulphite Bond & Ledgers—
Delivered Zone 1

	Bonds	Ledgers
No. 1 Sulphite	7.75	8.75
No. 2 Sulphite	6.75	7.75
No. 3 Sulphite	6.00	7.00
No. 4 Sulphite	5.50	6.50

F.o.b. Mill

Book, M. F.	.05¼	@	.06¼
Book, S. S. & C.	.05½	@	.07½
Book, Coated	.06½	@	.09
Coated Lithograph	.06¾	@	.08½
No. 1 Jute Manila	6.25	@	—
Manila Sul., No. 1	5.25	@	—
Manila No. 2	3.75	@	—
No. 1 Kraft	5.00	@	—
Southern Kraft	4.75	@	—
News Print Rolls	40.00	@	—
Straw Board	40.00	@	45.00
News Board	40.00	@	—
Chip Board	37.50	@	—
Wood Pulp Board	70.00	@	85.00
Binder Boards—			
No. 1, per ton	75.00	@	80.00
No. 2, per ton	70.00	@	75.00
Carload lots	65.00	@	70.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.06½	@	.07
New White, No. 2	.04½	@	.05
Light Silesias	.04	@	.05
Silesias, No. 1	.04	@	.04½
Black Silesias, soft	.03	@	—
New Unbleached	.06½	@	—
Washable, No. 1	.02	@	.02½
Blue Overall	.05	@	.05½
Cottons—According to grades—			
Washable, No. 2	.02½	@	.04½
New Blue	.02	@	—
Fancy	.01½	@	.02
New Black Soft	.04¼	@	—
New Light Seconds	.04	@	—
New Dark Seconds	1.10	@	—
Khaki Cuttings—			
No. 1 O. D.	.04	@	—
No. 2 Mixed	.03	@	.04
Corduroy	.01¾	@	.02
New Canvas	.03½	@	.04½
New Black Mixed	.02¼	@	.02½

Domestic Rags (Old)

White No. 1—			
Repacked	3.50	@	4.00
Miscellaneous	2.50	@	3.25
Thirds and Blues—			
Miscellaneous	1.75	@	2.00
Repacked	2.50	@	2.75
Black Stockings (Export)	4.50	@	5.00
Roofing Stock—			
Foreign No. 1	1.10	@	1.20
Repacked	1.30	@	1.50

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.75	@	—
Domestic	2.00	@	—
Manila Rope	2.50	@	—
Sisal Rope	.75	@	1.00
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	1.75	@	1.80
No. 2	.80	@	.90
Wool Tares, heavy	3.00	@	3.25
Mixed Strings	1.00	@	1.10
No. 1 New Light Burlap	2.25	@	2.50
New Burlap Cuttings	2.00	@	2.25

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.25	@	2.30
No. 2 Hard White	1.90	@	2.00
No. 1 Soft White	1.80	@	1.85
No. 2 Soft White	1.25	@	1.30
No. 1 Mixed	—	@	.75
Solid Ledger Stock	1.50	@	1.60
Writing Paper	1.00	@	1.10
No. 1 Books, heavy	.55	@	.60
No. 1 New Manila	1.50	@	—
Print Manila	.50	@	.60
Container Manila	—	@	.50
Old Kraft	1.00	@	—
No. 1 Mixed Paper	—	@	.30
Straw Board Chip	.40	@	—
Binders Board Chip	.40	@	—
Corrugated Board	.55	@	—
Overissue News	.60	@	—
Old Newspapers	.40	@	—

BOSTON

Paper

Rag Content Bond & Ledgers—
Delivered one 1

	Bonds	Ledgers
100% Rag Ext. No. 1	.36	.37
100% Rag	.28	.29
75% Rag	.21	.22
65% Rag	.18	.19
50% Rag	.15	.16
25% Rag	.12½	.13½

Sulphite Bond & Ledgers—
Delivered Zone 1

	Bonds	Ledgers
No. 1 Sulphite	7.75	8.75
No. 2 Sulphite	6.75	7.75
No. 3 Sulphite	6.00	7.00
No. 4 Sulphite	5.50	6.50

F.o.b. Mill

Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04¾	@	.05
No. 2 Kraft	.04½	@	.04¾

(F. o. b. Boston)

Southern Kraft	.03¾	@	.04½

(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots)
(Delivered New England points)

News Print Rolls	39.50	@	—
Straw Board, rolls	.009	@	35.00
Filled News Board	40.00	@	45.00
Chip Board	37.50	@	40.00
Single Manila Lined Chip	47.50	@	52.50
Single White, Patent Coated News Board (Bender)	55.00	@	65.00
Wood Pulp Board	70.00	@	75.00
Binder Boards (Standard Grade)	67.00	@	75.00

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.00	@	2.20
No. 1 Soft White	1.75	@	1.90
No. 2 Mixed	.75	@	.80
Solid Ledger Books	1.40	@	1.50
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	.85	@	.90
No. 1 Books, heavy	.55	@	.65
No. 1 Books, light	.50	@	.60
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.50	@	1.60
No. 1 Old Manila	.60	@	.65
White Blank News	1.25	@	1.30
No. 1 Kraft	1.05	@	—
Mixed Papers	.22½	@	.25
Print Manila	.50	@	.60
Container Manilas	.27½	@	—
Old Newspapers	.25	@	.27½
Overissue News	—	@	.35
Box Board Chips	—	@	.25
Corrugated Boxes	.35	@	.37½
Kraft corrugated boxes	.85	@	—
Screening Wrappers	.40	@	.45

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	2.00	@	2.25
Domestic	2.10	@	2.25
Transmission Rope	.90	@	1.00
Jute Rope	1.75	@	2.00
Jute Carpet Threads	1.00	@	1.10
Gunny No. 1—			
Foreign	2.00	@	2.25
Domestic	1.80	@	2.00
Bleachery Burlap	4.00	@	4.50
Scrap Burlap—			
Foreign	1.95	@	2.00
Domestic	1.60	@	1.75
Scrap Sisal	1.75	@	1.85
Scrap Sisal for Shredding	1.85	@	2.00
Wool Tares, heavy	2.00	@	2.10
New Burlap Cuttings	2.25	@	2.35
Australian Wool Pouches	3.00	@	3.25
Heavy Baling Bagging	2.50	@	2.75
Paper Mill Bagging	1.20	@	1.35
Bagging No. 2	.90	@	.95

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.01¾	@	.02
New White No. 1	.06¾	@	.07
New White No. 2	.04	@	.04¼
Silesias No. 1	.04½	@	—
New Black Silesias	.02½	@	.03
Soft Unbleached	.06¾	@	.07
Blue Cheviot	5.25	@	5.50
Fancy	.0225	@	.023
Washable	.0165	@	.0170
Cottons—According to grades—			
Blue Overalls	5.25	@	5.50
New Black, soft	.04	@	.04¼
Khaki Cuttings	.04	@	.04¼
O. D. Khaki	.04	@	.04¼
Corduroy	.01¾	@	.02
New Canvas	—	@	.05
B.V.D. Cuttings	—	@	.06¼

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1 90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues	1.50	@	2.00
Thirds and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62½
Black Stockings	2.50	@	3.00
Roofing Stock—			
No. 1	1.35	@	1.40
No. 2	1.15	@	1.20
No. 3	.95	@	1.00

Foreign Rags

(F. o. b. Boston)

Dark Cottons	1.60	@	1.70
New White Shirt Cuttings	6.50	@	6.75
Dutch Blues	2.25	@	2.50
New Checks & Blues	2.50	@	3.00
Old Fustians	1.90	@	—
Old Linsey Garments	2.10	@	—
New Silesias	4.50	@	4.75

TORONTO

Paper

(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.11	@	—
No. 2 Sulphite	.08½	@	—
No. 1 Colored	.12	@	—
No. 2 Colored	.09	@	—
Ledgers (sulphite)—			
Ledgers, No. 1	.34½	@	—
Ledgers, No. 2	.25½	@	—
Writing	.09	@	.09½
Book—			
No. 1 M. F. (Carloads)	6.50	@	—
No. 2 M. F. (Carloads)	6.00	@	—
No. 3 M. F. (Carloads)	6.00	@	—
No. 1 S. C. (Carloads)	7.00	@	—
No. 2 S. C. (Carloads)	6.50	@	—
No. 3 S. C. (Carloads)	6.50	@	—
No. 1 Coated and Litho	12.00	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted	13.00	@	—
Wrapping—delivered—			
Rag Brown	4.75	@	—
White Wrap	3.50	@	—
"B" Manila	5.25	@	—
No. 1 Manila	5.40	@	—
Fiber	5.40	@	—
Kraft, M. F.	5.90	@	—
Kraft, No. 2	5.40	@	—

(F. o. b. Cars Toronto)

News, per ton—			
Rolls (contract)	39.50	@	—
Sheets	44.50	@	—

Pulp

Ground wood	27.00	@	—
Unbleached Sulphite	42.00	@	—
Book (Class 1)	58.00	@	—
Writing (Class 2)	39.00	@	—
Select (Class 3)	60.00	@	—

Old Waste Paper

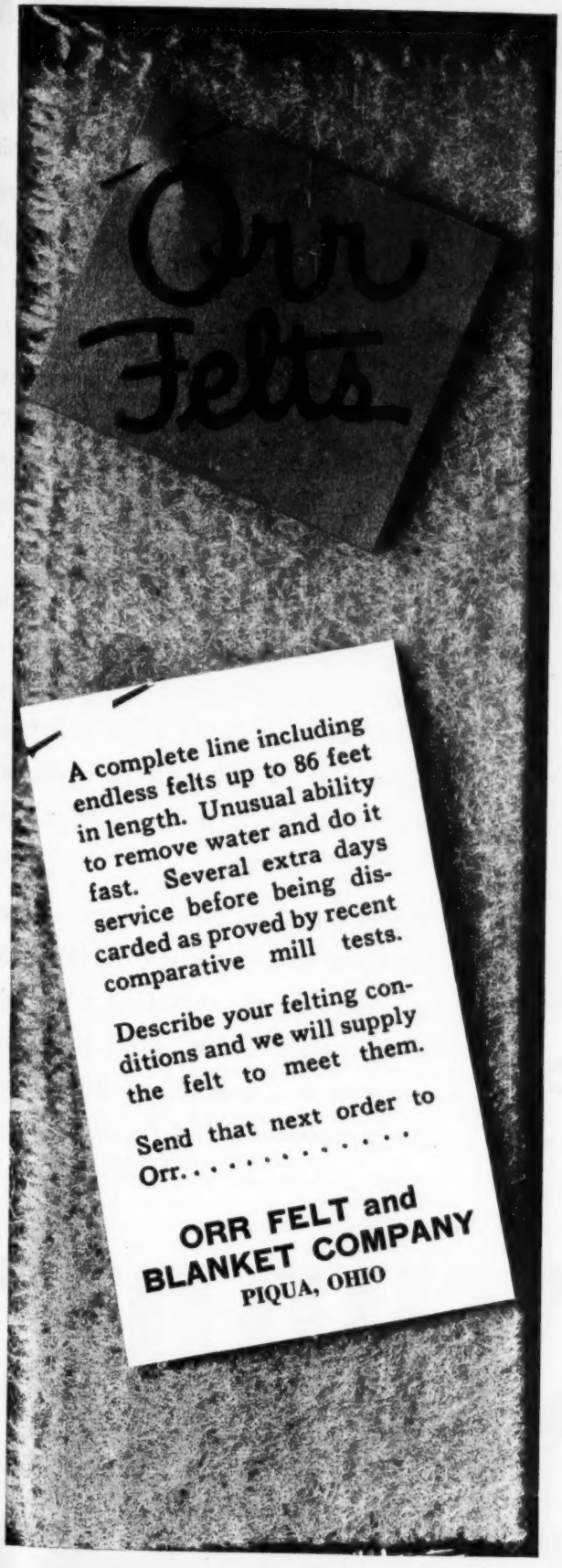
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.00	@	2.25
Soft White	1.60	@	1.90
White Blk. News	1.25	@	1.40
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	1.00
Light and Crumpled Book Stock	.80	@	.90
Ledgers and Writings	1.00	@	1.05
Manilas—			
New Manila Cut	1.25	@	1.40
Printed Manilas	.50	@	.60
Kraft	1.00	@	1.60
News and Scrap—			
Strictly Overissue	.55	@	—
Strictly Folded	.50	@	—
No. 1 Mixed Paper	.40	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.06¼	@	.06½
Fancy Shirt Cuttings	.02¼	@	.02½


Orr Felts
A complete line including endless felts up to 86 feet in length. Unusual ability to remove water and do it fast. Several extra days service before being discarded as proved by recent comparative mill tests.
Describe your felting conditions and we will supply the felt to meet them.
Send that next order to Orr. . . . . .
ORR FELT and BLANKET COMPANY
PIQUA, OHIO

PAPER TRADE JOURNAL
ESTABLISHED 1872
SIXTY-FOURTH YEAR
THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD
Published Every Thursday by the LOCKWOOD TRADE JOURNAL CO., Inc.
GEO. S. MACDONALD, President — J. BANNINGA, Sec.-Treas.
Published at 34 No. Crystal St., East Stroudsburg, Pa.
Executive and Editorial Offices: 15 West 47th Street, New York
Chicago Office: 135 West Madison St.

TABLE OF CONTENTS

Great Lakes Sold by Court Order 11
To Build Straw Board Mill 11
Acquires Assets of Maizewood Products 11
Eastern Tissue Corp. Formed 11
American Writing Reorganization Postponed 11
Wausau Mills Contemplate Changes 12
Bird & Son to Pay Bonus 12
Chicago Market Comparatively Favorable 13
Association Activities 13
Activities of Ontario Industry 14
Company's Earnings Improved 14
Charles Addoms Resigns 14
Boston Paper Demand Sustained 16
Price Bros. Reorganization 16
Allis-Chalmers Centrifugal Pumps 16
Philadelphia Paper Demand Active 18
Annual Christmas Party 18
Charles F. Hubbs Dead 18
Champion Fibre Income 18
Paper Grading Progress 21
New England TAPPI Discusses Costs 25
J. P. Prescott Tendered Banquet 26
St. Regis Proposes Cuts in Stock Values 26
May Acquire Package Paper Co. 26
Construction News 27
Editorial 28
TAPPI Specification E 400 s Changed 29
Production Ratio Report 29
Government Paper Bids 29
Technical Section
Properties and Sulphate Pulping Characteristics of Compression Wood 31
Ontario Paper Co. to Build Boiler Plant 34
Canadian Technical Meeting 34
Nickel in the Paper Industry 34
Waste Liquors and Gases of Paper Industry .. 35
Pulp and Paper Industry Literature Review ... 39
Imports of Paper and Paper Stock 43
New York Market Review 46
Miscellaneous Markets 48
Market Quotations 48

THE PAPER TRADE JOURNAL is indexed in Industrial Arts Index

Want and For Sale Advertisements, 54-55

Grind not the way the gods grind

• The "mills of the Gods grind slowly" but the new Seybold Automatic Knife Grinder grinds rapidly and truly any kind of bevel on any kind of straight edge the new economy way.

No matter what you grind or for whom, yourself or the trade, this new Seybold will do the old job in quite a new way yielding alignment, keenness and savings that only "perfect precision" describes.

Paper mill men, printers or machinists can grind the knives they use and turn out a job that will cut new knife costs because after a Seybold finishes its job only infrequent sharpening is needed to keep the edge keen, true and smooth.

Gears, clutch and traveling mechanism operate in a bath of oil. Grinding mechanism, the traveling wheel carriage type. All moving parts and controls in a single unit. Built rigidly for precision grinding only. Let us send you the details.

SEYBOLD MACHINE CO.
DAYTON, OHIO
DIVISION OF HARRIS-SEYBOLD-POTTER COMPANY
New York: E. P. Lawson Co., Inc. Chicago: Chas. N. Stevens Co., Inc.
Atlanta: J. H. Schroeter & Bro., Inc. San Francisco: Harry W. Brintnall Co.
Toronto: The J. L. Morrison Company

SEYBOLD